EXISTING CONDITIONS REPORT

General Plan **NOISE ELEMENT UPDATE**

LONG BEACH
DEVELOPMENT SERVICES
BUILDING A BETTER LONG BEACH

CITY OF
LONG BEACH

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Existing Conditions Report

for the City of Long Beach Noise Element

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Table of Contents

1.0 Introduction, Setting, and Fundamentals of Noise

1.1 Introduction 1-1
1.2 Physical Setting 1-2
1.3 Fundamentals of Noise and Vibration 1-3
1.4 Existing Noise Sources 1-10
1.5 Existing Vibration Sources 1-16
1.6 Community Engagement (Summary in Progress) 1-18

2.0 Existing Regulatory Setting

2.1 Federal Regulations 2-1
2.3 City of Long Beach 2-10

3.0 Existing Noise Analysis

3.1 Existing Noise Monitoring Results 3-1
3.2 Existing Traffic Noise Contours 3-1
3.3 Existing Airport Noise Contours 3-34
3.4 Existing Noise and Land Use Compatibility Discussion 3-34
3.5 References 3-36

Appendix A- Traffic Data

Figures and Tables

FIGURES

Figure 1 – Existing Major Noise Sources 1-11
Figure 2 – Noise Monitoring Locations 3-10
Figure 3 – Existing Traffic Noise Contours 3-14
Figure 4 – Existing Long Beach Airport Noise Contours 3-35

TABLES

Table A: Definitions of Acoustical Terms 1-5
Table B: Common Sound Levels and Their Noise Sources 1-5
Table C: Human Response to Different Levels of Ground-Borne Noise and Vibration 1-6
Table D: Construction Vibration Damage Criteria 2-1
Table E: California Office of Noise Control Land Use Compatibility Matrix for Community Noise Exposure 2-5
Table F: City General Plan Recommended Criteria for Maximum Acceptable Noise Levels[1] in A-Weighted Decibels (dBA) 2-10
Table G: Maximum Local Noise Criteria 2-11
Table H: Interior Noise Limits 2-12
Table I: Existing Long-Term 48-Hour Noise Level Measurements 3-2
Table J: Existing Short-Term Noise Level Measurements 3-4

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List of Abbreviations and Acronyms

AELUP	Airport Environs Land Use Plans
AICUZ	Air Installation Compatible Land Use Zone
ASTM	American Society for Testing and Materials International
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
City	City of Long Beach
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
g	Vibration unit equal to 9.81 m/s^2
I-405	Interstate 405
I-605	Interstate 605
I-710	Interstate 710
IIC	Impact Isolation Class
L_{10}	noise level exceeded 10 percent of the time during a stated period
L_{50}	median noise level
L_{90}	the noise level exceeded 90 percent of the time
L_{dn}	day-night average level
L_{eq}	equivalent continuous sound level
L_{max}	maximum noise level
Metro	Los Angeles Country Metropolitan Transportation Authority
mph	miles per hour
OITC	Outdoor-Indoor Sound Transmission Class
PPV	peak particle velocity
RMS	root-mean-square
SENEL	Single Event Noise Equivalent Level
SR-1	State Route 1 or Pacific Coast Highway
SR-103	State Route 103
SR-22	State Route 22
SR-91	State Route 91
State	State of California
STC	Sound Transmission Class
VdB	vibration velocity decibels

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Introduction, Setting, and Fundamentals of Noise

1

1 Introduction, Setting, and Fundamentals of Noise

» 1.1 Introduction 1-1

» 1.2 Physical Setting 1-1

» 1.3 Fundamentals of Noise and Vibration 1-3

1.3.1 Characteristics of Sound 1-3

1.3.2 Measurement of Sound 1-4

1.3.3 Physiological Effects of Noise 1-6

1.3.4 Fundamentals of Ground-borne Vibration 1-9

» 1.4 Existing Noise Sources 1-10

1.4.1 Sources 1-10

1.4.2 Traffic Noise 1-10

1.4.3 Rail Noise 1-12

1.4.4 Aircraft Noise 1-13

1.4.5 Watercraft Noise 1-14

1.4.6 Port of Long Beach 1-14

1.4.7 Special Events Noise 1-14

1.4.8 Stationary Noise Sources 1-15

1.4.9 Nuisance Noise 1-15

» 1.5 Existing Vibration Sources 1-16

1.5.1 Vibration Sources 1-16

1.5.2 Construction Activity Vibration 1-16

1.5.3 Rail Activity Related Vibration 1-17

1.5.4 Heavy Vehicles and Buses 1-17

1.5.5 Other Sources of Vibration Annoyance 1-17

» 1.6 Community Engagement 1-18

1.0 Introduction, Setting, and Fundamentals of Noise

1.1 Introduction

Due to potential impacts associated with elevated noise and vibration impacts and the effects on citizens within its cities, the California legislature in 1972 mandated that a noise element be included as part of city and county general plans. The current State of California General Plan Guidelines provides the specific requirements for a noise element (2003).

The Noise Element is a mandatory element of the City of Long Beach General Plan, and sets forth policies regarding noise and land use throughout the City. The Noise Element was last updated in 1975, and was implemented through a 1977 noise ordinance. Since that time, the City's physical makeup, population, regional context, and the regulatory guidance around noise have changed significantly.

This Existing Conditions Report discusses the fundamental concepts of noise, provides a comprehensive summary of noise in the City that will inform the future Noise Element vision, goals and policies, as they relate to the entirety of the General Plan Update, including the Land Use Element and provides a summary of the existing regulations and current General Plan Noise Element.

The Noise Element does the following:

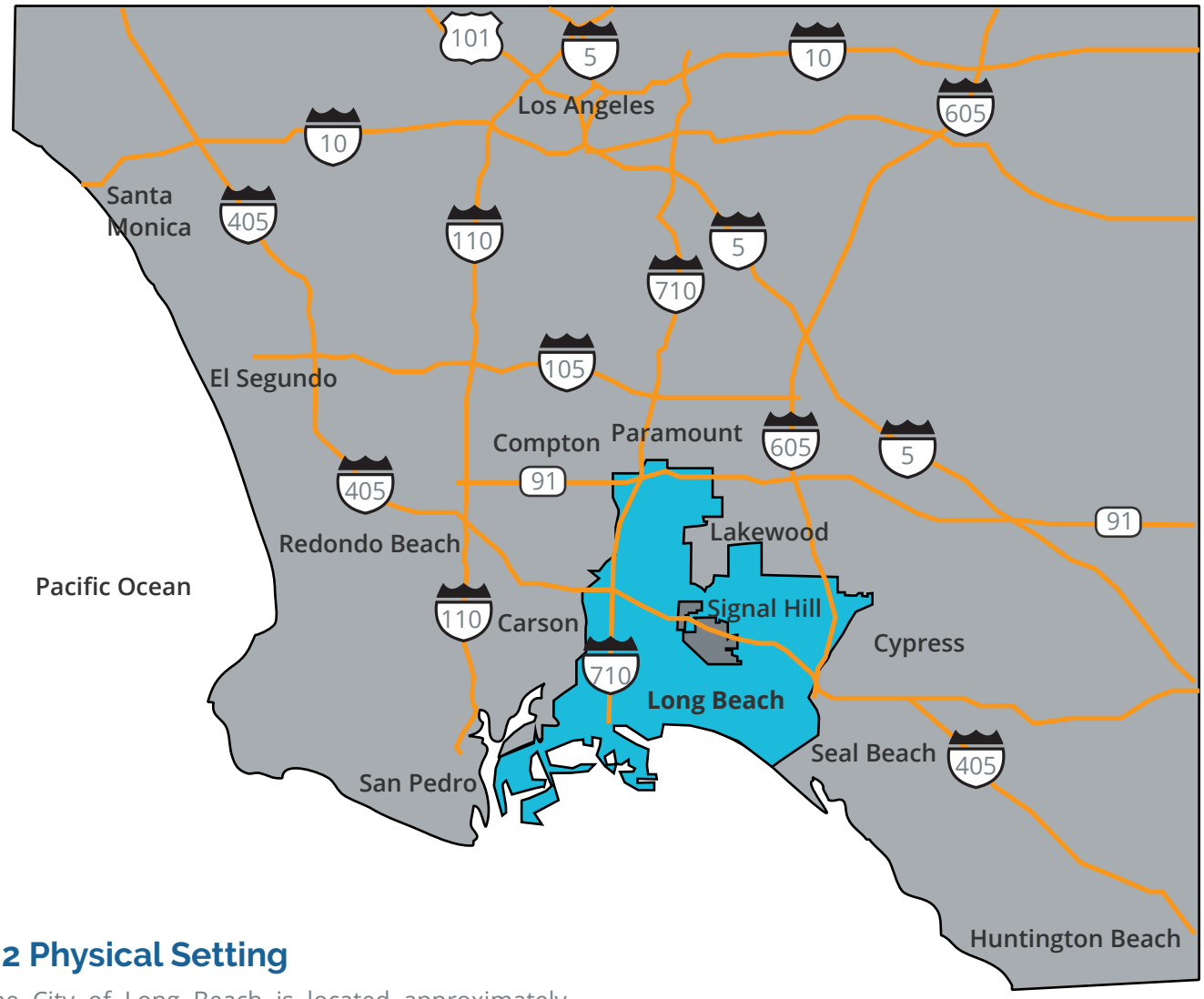
Discusses noise characteristics and documents the existing and potential future noise environment for those in the community,

Provides standards and references for various public and private development projects, as required by law,

Establishes uniformity of policy and direction within the City concerning actions to minimize or eliminate noise pollution and to make decisions regarding proposals that may have an impact on the City's noise environment,

Serves as an official guide to City decision-makers and departments, individual citizens, businesses, and private organizations concerned with noise pollution in the City, and

Provides policies and goals the decision-makers can enforce in order to maintain a desirable environment as it relates to noise and vibration on a day-to-day basis.



1.2 Physical Setting

The City of Long Beach is located approximately 24 miles south of the City of Los Angeles in Los Angeles County, California. The City is surrounded by neighboring cities including Los Angeles, Carson, Compton, Cypress, Paramount, Bellflower, Lakewood, Hawaiian Gardens, Los Alamitos, and Seal Beach. The City is bounded to the south by the Pacific Ocean. The City of Signal Hill is completely surrounded by the City. The City is made up of various community plan areas and neighborhoods, which are presented on Map LU-4 of the Land Use Element (City of Long Beach) which is anticipated to be adopted in 2017. The City is generally bounded by the major transportation facilities including Interstate 605 (I-605), Interstate 710 (I-710), and State Route 91 (SR-91), and is bisected by State Route 22 and Interstate 405 (I-405). Additionally, the Port of Long Beach is located in the southwestern corner of the City and the Long Beach Airport is located in the northcentral portion of the City.

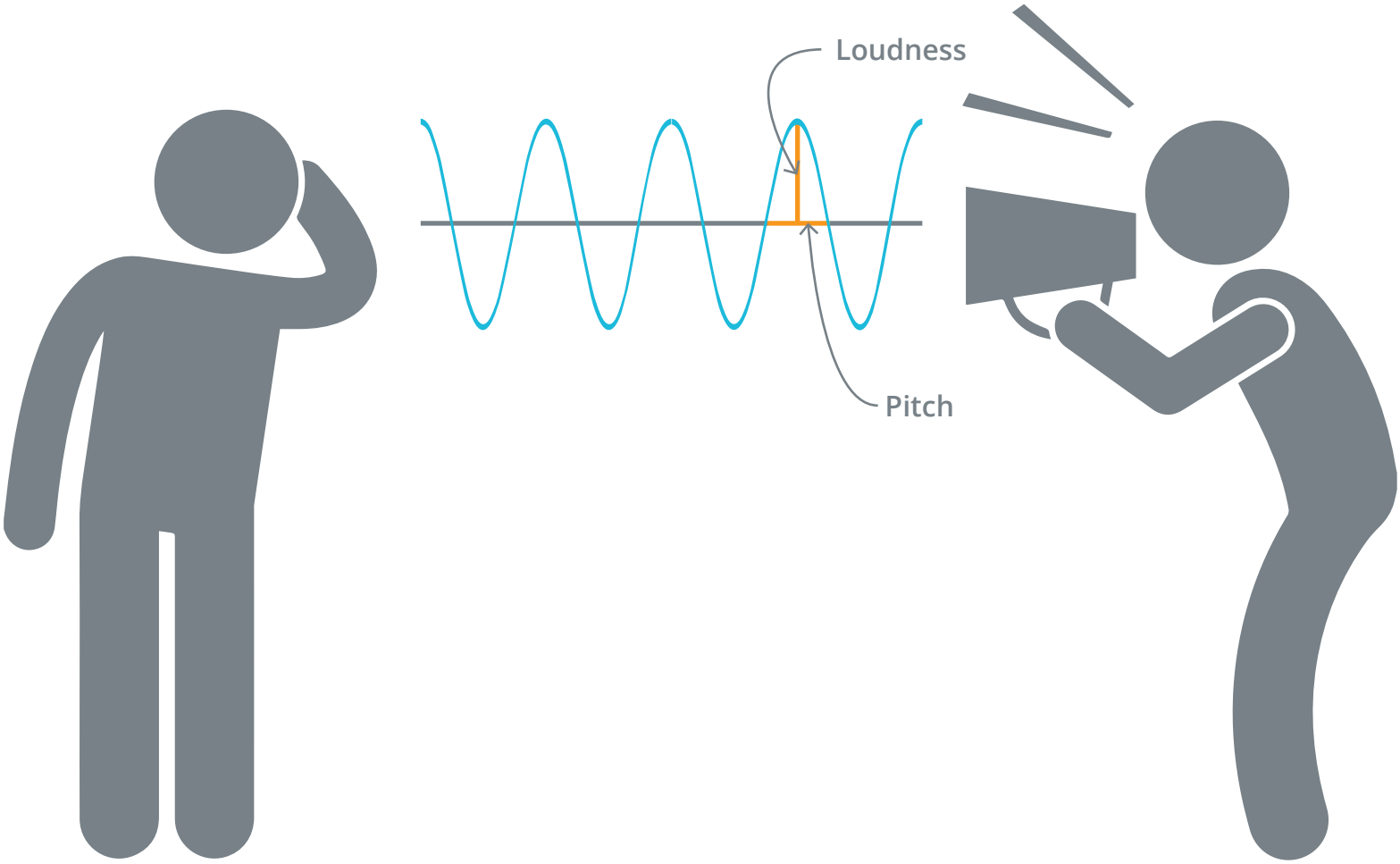
1.3 Fundamentals of Noise and Vibration

1.3.1 Characteristics of Sound

Sound is increasing in the environment and can affect 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, and 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 and describes a noisy or quiet environment; it is measured by the amplitude of the sound wave.

Loudness is determined by the intensity of the sound waves 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. Typically, a noise analysis defines the noise environment within a specific area in terms of sound intensity and the effect on adjacent sensitive land uses.

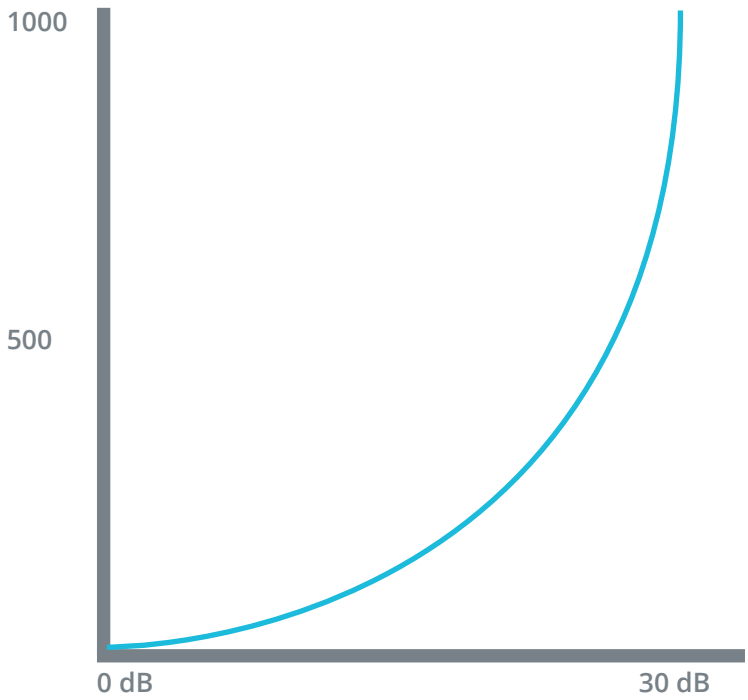


1.3.2 Measurement of Sound

Sound intensity is measured through the A-weighted 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 are measured on a logarithmic scale representing points on a sharply rising curve. For example, 10 decibels (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 decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound-pressure energy. 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 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

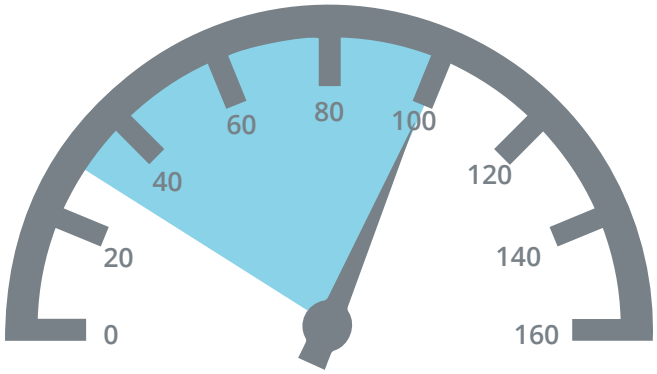
Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single-point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., 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. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California (State) are the L_{eq} and the Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on A weighted decibels. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly



Intensity of decibels

Ambient sounds generally range from 30 decibels (very quiet) to 100 dBA (very loud)



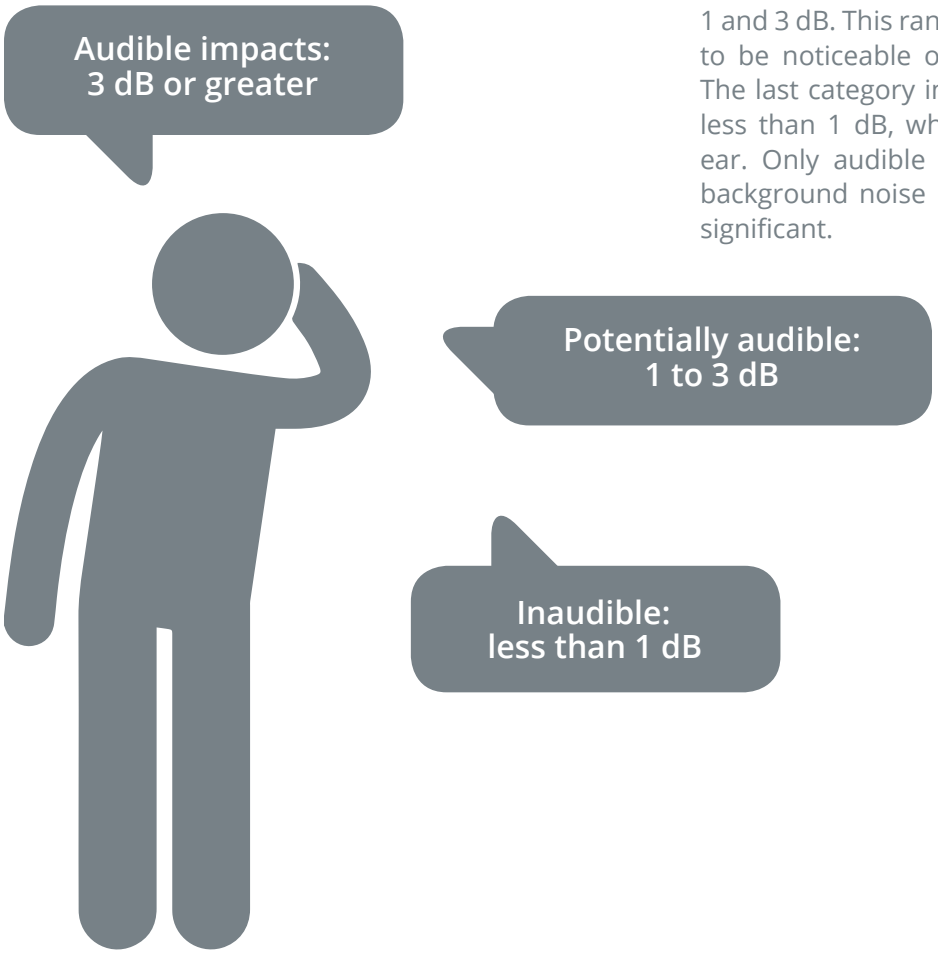
A-weighted decibels (dBA) of ambient sounds

L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring 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 within 1 dBA of each other and are normally interchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

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 are specified in terms of Lmax for short-term noise impacts. L_{max} reflects peak-operating conditions and addresses the annoying aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. 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 of the time the noise level exceeds this level, and half of 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, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first includes audible impacts, which 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 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise level 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.



What level is audible?

1.3.3 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 and 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 the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 dBA to 165 dBA will potentially result in dizziness or loss of equilibrium. The ambient or background noise problem is common and generally more concentrated in urban areas than in outlying, less-developed areas.

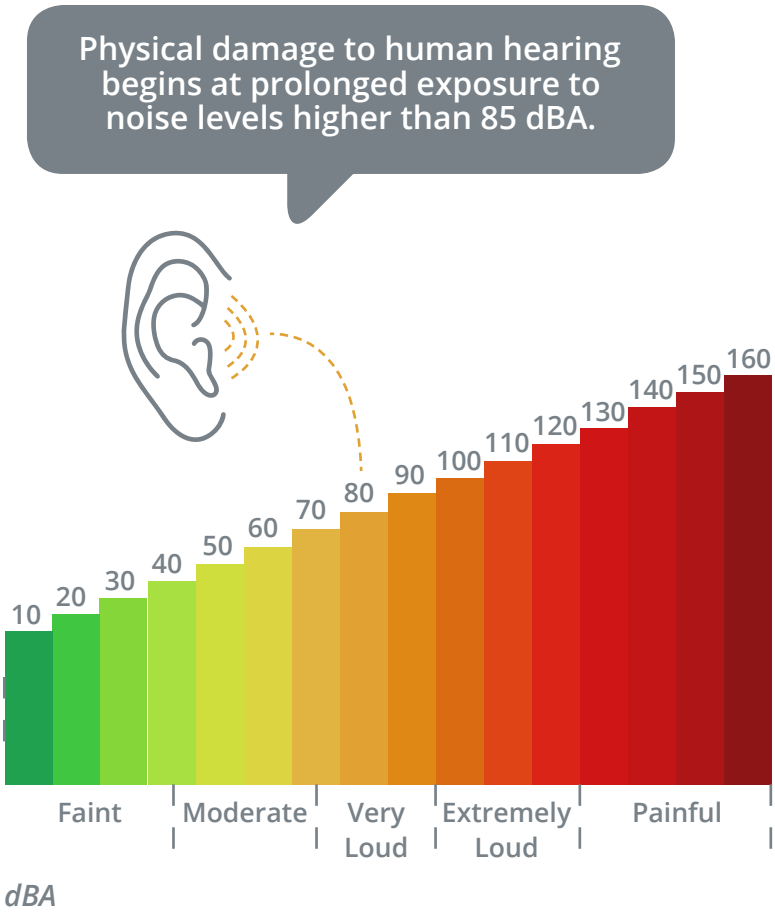
In addition to the audible effects of noise, research has shown that prolonged exposure to elevated noise levels may have other negative health effects. As presented in Wolfgang Babisch's *Cardiovascular Effects of Noise*, sleep disturbance is considered a major environmental effect. It is estimated that 80 to 90 percent of the reported cases of sleep disturbance in noisy environments are for reasons other than noise originating outdoors. Examples of sleep disturbance causes include restroom trips; indoor noises from other occupants; worries; illness; and climate. Field studies conducted with people in their normal living situations are scarce.

The primary sleep disturbance effects of noise are: difficulty in falling asleep (increased sleep latency time); awakenings; and alterations of sleep stages or depth, especially a reduction in the proportion of REM-sleep[1]. Other physiological effects can be induced by noise during sleep, including increased blood pressure; increased heart rate; increased finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and an increase in body movements. For each of these physiological effects, both the noise threshold and the noise-response relationships may be different. Different noises may also have different information content and this also could affect physiological threshold and noise-response relationships.

Exposure to night-time noise also induces secondary effects, or so-called after effects. These are effects that can be measured the day following the night-time exposure, while the individual is awake. The secondary effects include reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance.

Long-term effects on psychosocial well-being have also been related to noise exposure during the night. Noise annoyance during the night-time increased the total noise annoyance expressed by people in the following day. Various studies have also shown that people living in areas exposed to night-time noise have an increased use of sedatives or sleeping pills. Other frequently reported behavioral effects of night-time noise include closed bedroom windows and use of personal hearing protection. Sensitive groups include the elderly, shift workers, persons especially vulnerable to physical or mental disorders and other individuals with sleeping difficulties.

Table A lists definitions of acoustical terms and Table

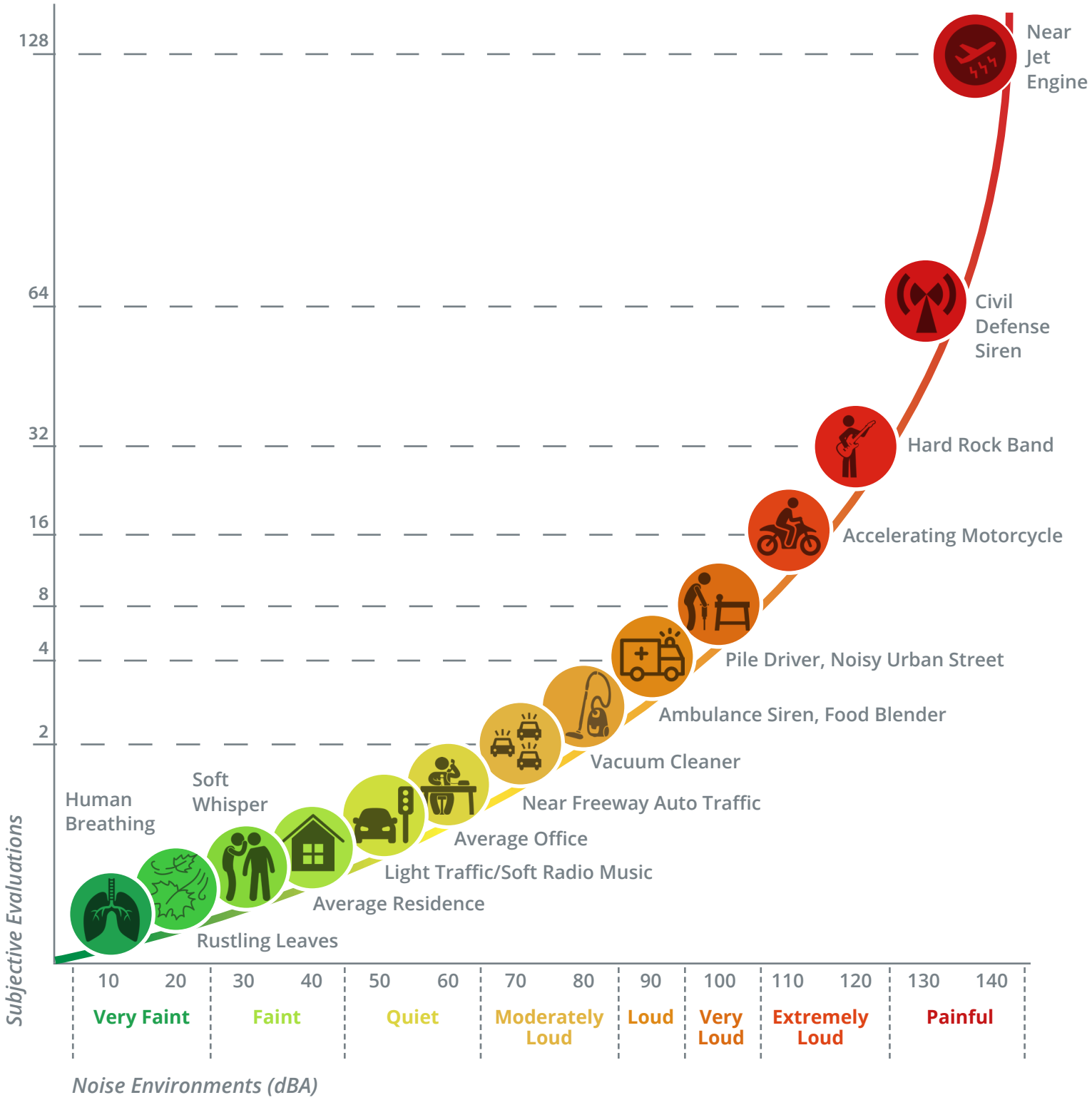


B shows common sound levels and their noise sources.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of noise level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time; the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted, unless reported otherwise.)
L_{02}, L_{08}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter during a designated time interval using fast-time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal or informational content, and the prevailing ambient noise level.
Sound Exposure Level (SEL)	A measure of the total noise within an event which accounts for duration.
Single Event Noise Equivalent Level (SENEL)	The sound exposure level for a defined noise threshold level.
Source: Handbook of Acoustical Measurement and Noise Control (Harris 1991).	

Table B: Common Sound Levels and Their Noise Sources



1.3.4 Fundamentals of Ground-borne Vibration

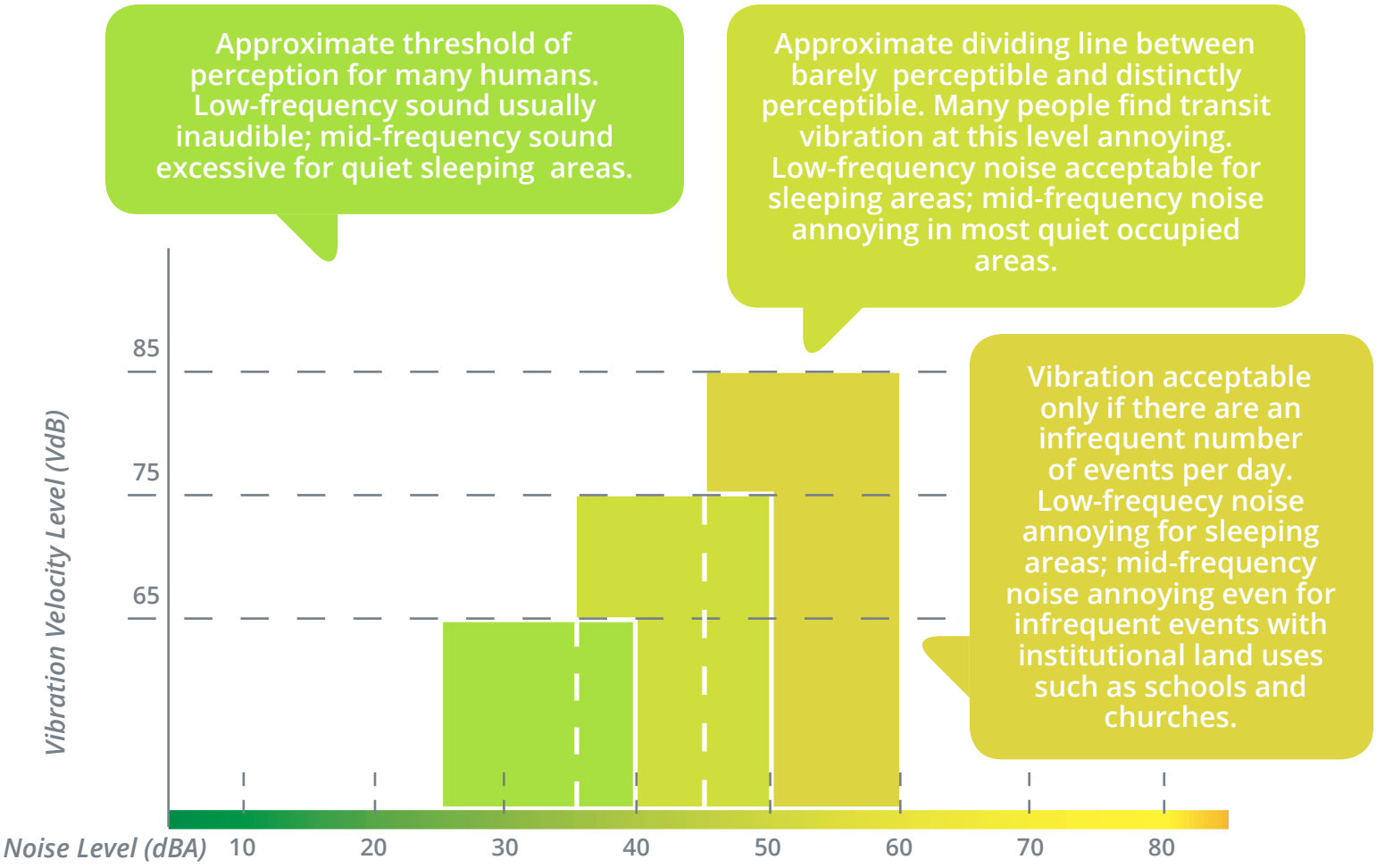
Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including peak particle velocity (PPV) and root-mean-square (RMS) velocity. PPV is defined as the maximum instantaneous positive 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. Low-level vibrations frequently cause irritating secondary vibration (e.g., a slight rattling of windows, doors, or stacked dishes). The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

In urban environments (e.g., City of Long Beach), sources of ground-borne vibration include construction activities (specifically pile driving and blasting), light and heavy rail transit, and heavy trucks and buses.

Table C displays continuous vibration impacts on human annoyance. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

Table C: Human Response to Different Levels of Ground-Borne Noise and Vibration



1.4 Existing Noise Sources

1.4.1 Sources

Major noise sources in the City include traffic, rail, aircraft, and stationary sources. The most important difference between transportation and non transportation noise sources is that municipalities can generally exercise control on the level and duration of noise at the property line of any non transportation source of noise. Cities can adopt noise exposure standards for noise levels generated from mobile sources (e.g., trucks, trains, or planes) and then make permitting decisions regarding the sensitivity of land uses in areas with excessive noise. Cities play a role in enforcing the requirement in the State vehicle code regarding properly operating mufflers and also may set speed limits or weight restrictions on local streets. In general terms, the City's actions are primarily proactive with respect to stationary noise sources versus reactive for mobile sources. Figure 1 shows the location of the dominant and major noise sources on a City level.

I-405 Freeway

1.4.2 Traffic Noise

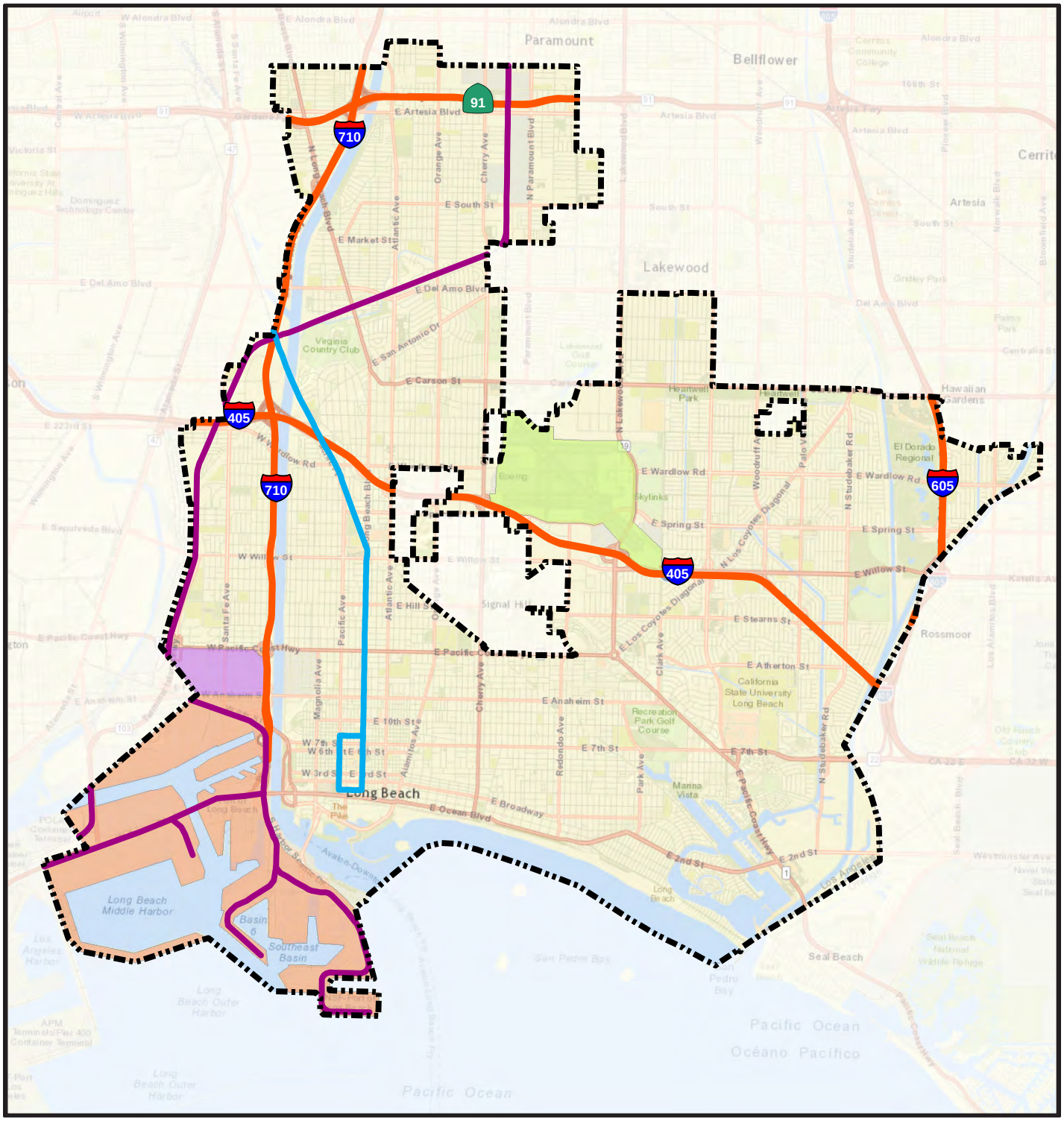
Automobiles, buses, trucks, motorcycles and trains dominate transportation noise in the City. Traffic moving along streets and freeways produces a sound level that remains relatively constant and is part of the City's minimum ambient noise level. Vehicular noise varies depending on the volume, speed and type of traffic. Slower traffic produces less noise than fast moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise is also associated with vehicles, including sirens, vehicle alarms, slamming of doors, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies. Often times, noise from motorcycle activities are specifically noticed over general traffic noise impacts due acceleration, exposed motor and, in some cases, lack of or modified mufflers.

Bus service is provided on major streets, collectors, and local streets within the City's circulation system. For the purpose of assessing vehicular noise, three generic weight classifications are considered (light, medium, and heavy). At 35 mph, 1 medium duty truck is as loud as 10 cars, 1 bus is as loud as 20 cars, and 1 heavy truck is as loud as 30 cars. In addition, noise from traffic sources may be worsened by grade (inclined roadway) or by the condition of the pavement.

Major transportation noise sources in the City include traffic on I-405, I-605, I-710, SR-22, SR-91, State Route 103 (SR-103), Terminal Island Freeway, Pacific Coast Highway or State Route 1 (SR-1), and Long Beach Boulevard.

In addition to typical automobiles and medium and heavy trucks, the City is currently served by Long Beach Transit, a public transit agency, with bus service along major roadways in the City through various routes (i.e., Routes 1, 21, 22, 81, and 192). The Los Angeles County Metropolitan Transportation Authority (Metro) operates a limited number of local and express buses. The Long Beach Transit Gallery serves as the southern terminus of the Metro Blue Line and is the main transit hub for bus connections to various Metro, Long Beach Transit, Los Angeles Department of Transportation Commuter Express, and Torrance Transit bus routes.

Figure 1: Existing Major Noise Sources



LSA

LEGEND

- Long Beach City Boundary
- Long Beach Airport
- Port of Long Beach
- Industrial Area
- Freeway
- Metro Blue Line
- Freight Line

0 0.75 1.5
MILES

SOURCE: Esri (2016); LSA (5/2017)

FIGURE 1

City of Long Beach Noise Element Update

Existing Major Noise Sources

1.4.3 Rail Noise

The noise impacts associated with rail activities depend heavily on a number of factors, including the type of train, the length of train, the physical track conditions, the geometry and intervening structures between the rail line and its receptor, the number of trains operating during the daytime, the number of trains operating during the nighttime, and the speed of the train. Additionally, when a horn is required to sound a warning, which is typical for at-grade crossings, the noise impact would be greatest at the land uses closest to the intersection.

Currently, three freight rail lines pass through the City which are operated by Burlington Northern Santa Fe Corporation (BNSF) Railway, Union Pacific Railroad Company (UPRR), and Pacific Harbor Line Incorporated (PHL). The rail lines run north-south through the west side of the City, through the northwest corner of the City, around the neighborhood of North Long Beach.

In addition to freight activities, the Metro Blue Line which serves as public transit, is part of the Metro Rail System that runs north-south from Los Angeles to Long Beach, traveling south via Long Beach Avenue, Willowbrook Avenue, and Long Beach Boulevard to its final destination at the Long Beach Transit Gallery. The Metro Blue Line operates daily, including all major holidays.

Based on the Federal Railroad Administration crossing inventories completed between January 1, 2000 and September 17, 2017 conducted at various crossings in the City, typical operations along the main rail line included up to 74 trains per day ranging in speed from 5 to 25 mph.

Noise impacts associated with rail activities depend heavily on type of train, the length of train, the physical track conditions, the geometry and intervening structures between the rail line and its receptor, the number of trains operating during the daytime, the number of trains operating during the nighttime, and the speed of the train.

Metro Blue Line

1.4.4 Aircraft Noise

Aircraft noise within the City is predominately influenced by operations at the Long Beach Airport located within the City limits. Operations at the Long Beach Airport include commercial air carriers, commuter flights, industrial planes, charter flights, and other general aviation. Operation at the Long Beach Airport typically occurs within the daytime hours of 7:00 a.m. to 10:00 p.m., with the exception of occasional unscheduled landings that occur after 10:00 p.m., and emergency and police helicopter activities. *The Long Beach Airport Community Guide to Aircraft Noise* presents factual information on the City of Long Beach Airport Noise Compatibility Ordinance (Long Beach Municipal Code Chapter 16.43) and Long Beach Airport's efforts to minimize aircraft noise over nearby neighborhoods. While the City is not able to control the flight paths, typical operations include approaches from the southeast of the airport and departures taking off in a northwest direction.

Apart from the restrictions on hours of day, noise budgets are utilized to limit aircraft activities. Noise budgets do not directly restrict the operation of a particular aircraft, in contrast to night time restrictions, but they restrict access by the fleet as a whole. Noise budgets restrict the overall noise during a certain period of time, which could be seasonally related or annual.

Currently, the City has implemented a Helicopter Noise Reduction Study Group that provides members of the public the opportunity to meet with both City and Airport staff to discuss issues and concerns regarding helicopter noise including rotor or "chop" noise, hovering, and inconsistent flight paths. While the City cannot directly control the majority of the operations associated with helicopters, specifically those related to emergency and police, the City maintains an interest in helping resolve noise issues where possible. Members of the communities are currently participating as a part of the Los Angeles Area Helicopter Coalition (LAAHNC) and regularly meet with Federal Aviation Administration (FAA) representatives, helicopter operators, and Long Beach Airport staff in an effort to reduce noise exposure from helicopter operations.

Long Beach Airport Runway

Long Beach Airport

1.4.5 Watercraft Noise

Watercraft noise along the southern portion of the City varies greatly depending on watercraft type, distance from mainland, and overall control and use of equipment. While the City does not currently have any specific criteria related to noise associated with watercraft, the State of California Department of Motor Vehicles, as part of its requirements for watercraft operations, does have regulations that would also be applicable in the City of Long Beach.

1.4.6 Port of Long Beach

Port of Long Beach operations noise levels are generally limited to the areas with the perimeter of the Port. Noise associated with the Port includes cranes, forklifts, and truck activities. Due to the distance from daily operations, which are located close to the coast, to the nearest sensitive uses, noise impacts are rarely audible at such a large distance. Heavy truck traffic associated with the transport of cargo along the I-710 corridor is the primary source of noise associated with the Port. Impact associated with the Port of Long Beach, including noise, were assessed in the *Port of Long Beach Community Impact Study* in July 2016.

1.4.7 Special Events Noise

The City of Long Beach is a growing tourist destination with occasional noise generating from temporary special events and filming. From major conventions and international sporting events to community-based festivals, parades, film production and athletic activities, special events cultivate civic pride, social awareness and cultural enrichment for both residents and visitors.

These temporary events include, but are not limited to, community festivals, runs/walks, citywide holiday celebrations, Long Beach Grand Prix, Long Beach Marathon, Long Beach Lesbian and Gay Pride Parade and Celebration, Jazz Festival, film production, and events hosted at the Queen Mary such as Dark Harbor and Chill. These activities help build a foundation that fosters sustainable community development, economic development, and tourism.

Rainbow Harbor

Long Beach Grand Prix

The City of Long Beach hosts many seasonal events which may generate noise.

Temporary events and filming are exempt from the noise ordinance, as they are temporary in nature. Special Events and Filming staff are trained to be sensitive to the needs of the residents and strive to strike a balance between visitors and constituents. Events are listed on the calendar and can be found at www.filmlongbeach.com.

1.4.8 Stationary Noise Sources

Commercial, commercial-industrial, light-industrial, and to a lesser extent residential land uses in the City have the potential to generate high noise levels and impact surrounding land uses with their equipment operation. Noise sources from these land uses include air conditioning or refrigeration units, power tools, lawn equipment, generators, and other powered mechanical equipment. Additionally, activities that are not necessarily "stationary" include parking lot activities, truck deliveries, and events are oftentimes classified in the same categories.

Truck deliveries are a stationary noise source

1.4.9 Nuisance Noise

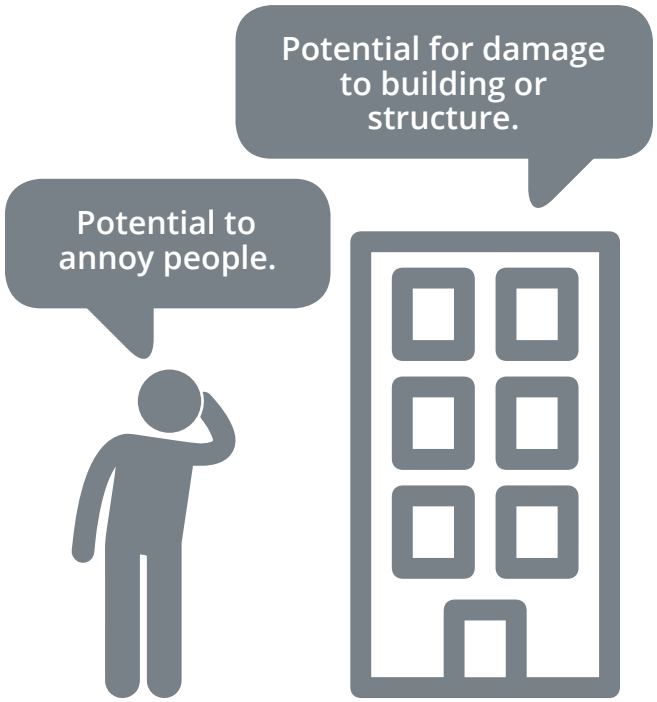
The City of Long Beach has a wide variety of land use types. Within the commercial and downtown area, certain uses including restaurants, bars, and clubs have the potential to generate noise which may be perceived as annoying or disturbing. Additionally, sources of noise that are permissible under existing laws and regulations still have the potential to disrupt the peace, cause sleep interference, and can create an undesirable setting for residents. The following list identifies some of the potential sources of noise that have been noted to occur with regularity in the City limits:

Other potential noise sources

1.5 Existing Vibration Sources

1.5.1 Vibration Sources

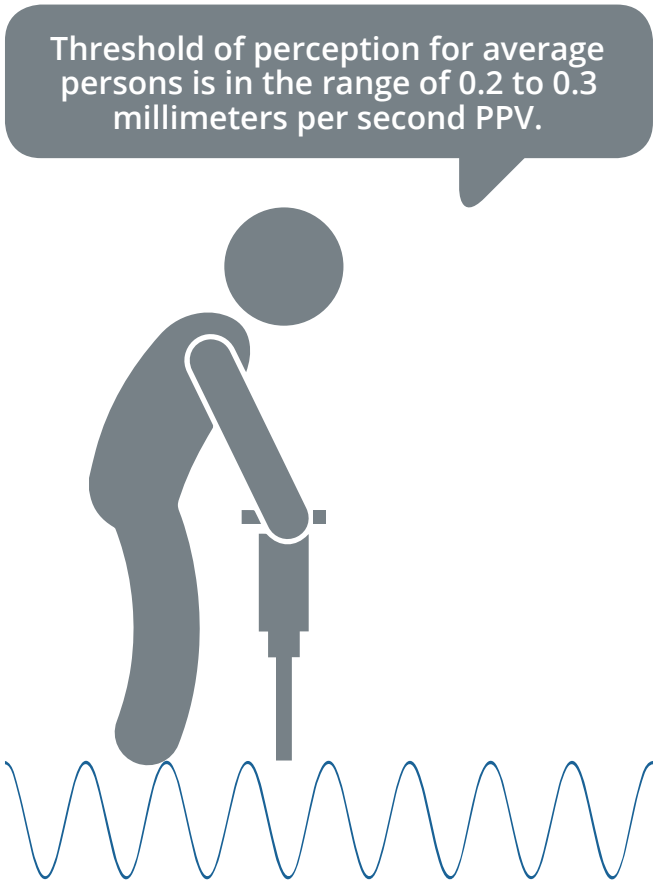
Major vibration sources in the City include construction activities, rail operations, heavy vehicle traffic, and vehicle loading and delivery operations. Other sources which have the potential to cause vibration impacts are aircraft operations, low-frequency music and some stationary sources. Similar to noise standards, cities can adopt vibration exposure standards regarding the sensitivity of land uses which may be affected. In relation to vibration impacts, there are two factors that are considered to assessing the level of impact expected: the potential for damage to a building or structure and the potential of annoyance to people. Also similar to potential noise impacts, the most efficient actions to help reduce vibration impacts occur during the planning and permitting phases of any project or development.



Two factors help measure the impact of noise to humans and buildings.

1.5.2 Construction Activity Vibration

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans. The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.2 to 0.3 millimeters per second (0.008 to 0.012 inches per second), PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels (e.g., people in an urban environment) may tolerate a higher vibration level. Structural damage can be classified as cosmetic only (e.g., minor cracking of building elements) or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat



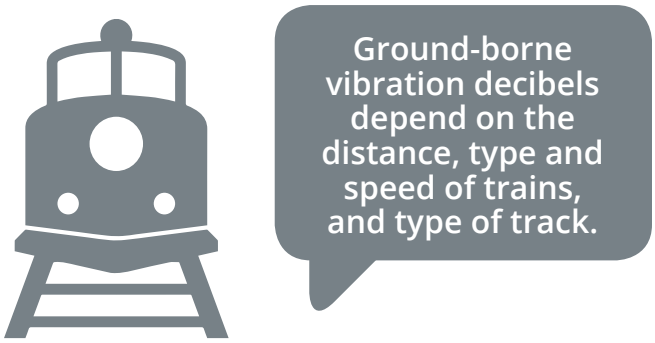
Construction-induced vibration may interfere with the enjoyment of life.

for structural damage to the building. Construction-induced vibration that can be detrimental to a building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity (e.g., impact pile driving) occurs immediately adjacent to the structure.

1.5.3 Rail Activity Related Vibration

Rail operations are potential sources of substantial ground-borne vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground-borne vibration has been correlated best with how quickly sounds moves through the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1 x 10-6 inches per second. RMS, which equals 0 vibration velocity decibels (VdB), and 1 inch per second equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels.

One of the problems with developing suitable criteria for ground-borne vibration is the limited research into human response to vibration and, more importantly, human annoyance inside buildings. The United States Department of Transportation, Federal Transit Administration has developed rational vibration limits that can be used to evaluate human annoyance to ground-borne vibration. These criteria are primarily based on experience with passenger train operations (e.g., 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.



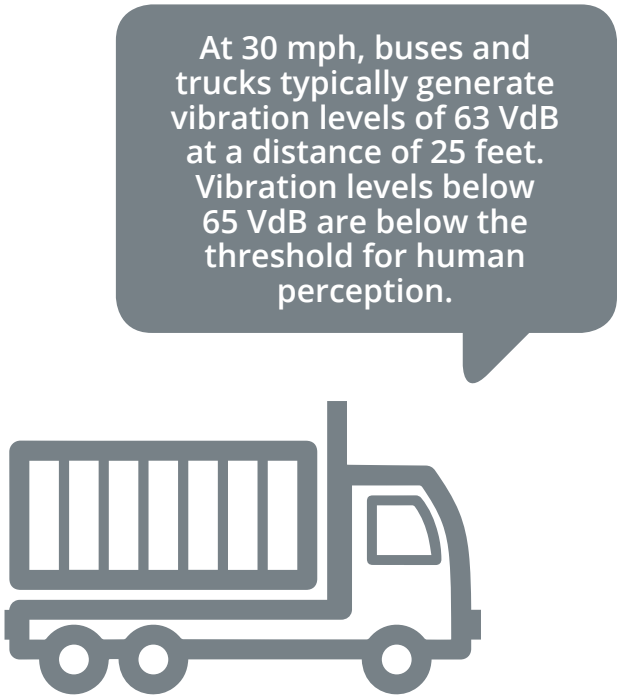
Many factors affect ground-borne vibration.

1.5.4 Heavy Vehicles and Buses

Ground-borne vibration levels from heavy trucks and buses are not normally perceptible, especially if roadway surfaces are smooth. Buses and trucks typically generate ground-borne vibration levels of about 63 VdB at a distance of 25 feet when traveling at a speed of 30 miles per hour (mph). Higher vibration levels can occur when buses or trucks travel at higher rates of speed or when the pavement is in poor condition. Vibration levels below 65 VdB are below the threshold for human perception.

1.5.5 Other Sources of Vibration Annoyance

In addition to activities that have vibration impacts which translate through the ground surface between source and receptor, sources which generate high levels of low-frequency noise may generate vibration through air. These sources may include aircraft and helicopter operations, low-frequency music and other large stationary sources. When the vibration effects of these sources are felt or experienced by a receptor, to determine the level of impact, low-frequency noise measurements are the best method to determine the impact.



How loud are busses and trucks?

1.6 Community Engagement

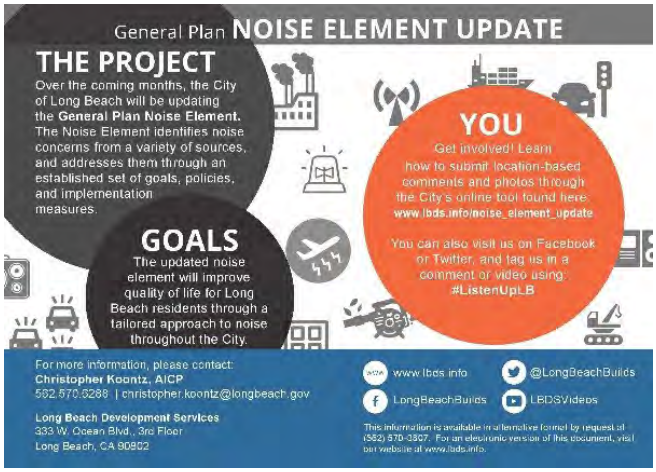
To inform the Noise Element update and identify potential issues, a variety of community engagement strategies were employed during 2017. A City of Long Beach project webpage was established as well as a Facebook and Twitter account for the Noise Element at #ListenUpLB. Project background was furnished and the community was invited to use an online engagement tool linked on the sites. The online tool provided a map-based ability to provide comments on a range of topics linked to specific locations throughout the city. Awareness of this opportunity for participation was provided through the City's website, emails, Facebook and Twitter advertising, and counter cards placed throughout city hall and other locations. Materials were provided in both English and Spanish.

In addition, a series of meetings were conducted with internal and external stakeholders. Initial meetings were held with City departments and local agencies including the Police Department, Noise Control Office, Animal Care Services, Public Works, Port, Airport and Long Beach Unified School District. Meetings with focus groups included public health professionals/academics, environmental justice, bar and restaurant operators, and the construction industry, as well as the Environmental Health Working Group and various local school students in their classrooms. Further, a Planning Commission study session was conducted on April 20, 2017 to introduce the Noise Element work effort and solicit comments from commissioners and members of the public.

Feedback provided through these various platforms covered an array of topics and key themes are summarized below:

- Develop regulations that respond to the evolution of neighborhoods
- Needed coordination with other regulatory agencies (rail, on-road vehicles, aircraft)
- Common annoyances: Leaf blowers, rail line operations, motorcycles, helicopters, loud music, construction, dogs, park/beach activities, bars/restaurants, autos/freeway, industrial and commercial uses
- Noise impacted communities in West Long Beach
- Effectiveness of good communication, relationship-building, proactive noticing
- Technology trending toward quieter equipment

Received comments and input informed the location of noise monitoring and the preparation of the existing conditions report content. In addition, this feedback will be carried forward to shape draft Noise Element strategies and policies.



Community Engagement Posters

Existing Regulatory Setting

2

2 Existing Regulatory Setting

» 2.1 Federal Regulations 2-1

2.1.1 Federal Railroad and Federal Transit Administrations 2-1

2.1.2 Environmental Protection Agency 2-2

2.1.3 International Building Code 2-2

» 2.2 State Regulations 2-2

2.2.1 State of California Noise Control Act 2-2

2.2.2 State of California Building Code 2-3

2.2.3 California Green Building Code 2-3

2.2.4 State of California Land Use Compatibility Criteria 2-4

2.2.5 State of California Vehicle Code 2-6

2.2.6 State of California Airport Land Use Requirements 2-9

2.2.7 State of California Motorized Watercraft Requirements 2-9

» 2.3 City of Long Beach 2-10

2.3.1 Existing Noise Element 2-10

2.3.2 Existing Municipal Code 2-10

2.3.3 Existing Noise Complaint Procedures 2-21

2.3.4 Current City Noise Regulation Efforts 2-22

2.0 EXISTING REGULATORY SETTING

2.1 Federal Regulations

While the City does not typically rely on any specific federal noise regulations given that the State level requirements, specifically the California Environmental Quality Act (CEQA), and the City's Noise Element and Municipal Code Noise Ordinance provide more specific and restrictive regulations related to noise and vibration impacts, the following information is provided for reference and may be used when local criteria are not established.

2.1.1 Federal Railroad and Federal Transit Administrations

The guidelines in the FTA *Transit Noise and Vibration Impact Assessment* (2006) general assessment establishes thresholds for construction noise identified as a 1-hour noise level of 90 dBA L_{eq} for residential uses during daytime hours and a 1-hour noise level of 100 dBA L_{eq} for commercial and industrial uses. This provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction when the noise thresholds are exceeded.

In addition to the vibration standards included in the FTA *Transit Noise and Vibration Impact Assessment* (FTA 2006) for ground-borne vibration impacts on human annoyance are shown in Table C above, the criteria for potential damage from ground-borne vibration and noise are based on the maximum levels for a single event. Table D lists the potential vibration building damage criteria associated with construction activities, as suggested in the *Transit Noise and Vibration Impact Assessment* (FTA 2006). FTA guidelines show that a vibration level of up to 102 VdB (equivalent to 0.5 in/sec in PPV) (FTA 2006) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a nonengineered (those not designed by an engineer or architect) timber and masonry building, the construction building vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table D: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_V (VdB)[1]
Reinforced concrete, steel, or timber (no plaster)	0.50	102
Engineered concrete and masonry (no plaster)	0.30	98
Non-engineered timber and masonry	0.20	94
Buildings extremely susceptible to vibration damage	0.12	90

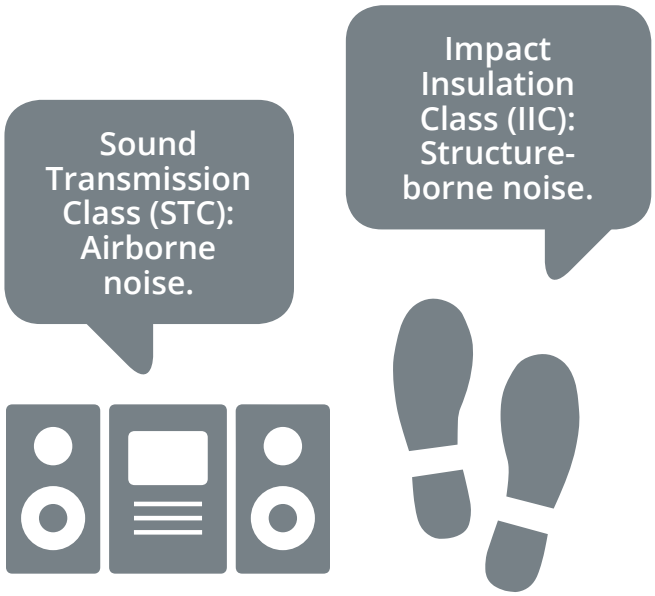
Source: Table 12-3, Transit Noise and Vibration Impact Assessment (FTA 2006).
1 RMS VdB re 1 µin/sec.
µin/sec = microinches per second
FTA = Federal Transit Administration
in/sec = inches per second
LV = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity in decibels

2.1.2 Environmental Protection Agency

In 1972 Congress enacted the Noise Control Act. This act authorized the Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish appropriate levels of sound. The document *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety* (EPA 1974) established that noise levels less than or equal to 45 dBA would not interfere with indoor activities or cause annoyance. Thus, an interior noise level of 45 dBA CNEL or less is often used to assure exterior façades will provide adequate noise reduction.

2.1.3 International Building Code

The International Building Code (IBC) (ICC 2015) has been adopted and used as a standard code throughout most of the United States. Within the IBC, standards for both reference or laboratory ratings as well as field measured rating requirements are identified to assure interior noise environment thresholds are met. There are two specific class ratings: (1) STC or Sound Transmission Class and (2) IIC or Impact Insulation Class. The STC rating is often used for room-to-room assemblies and focuses more on airborne noise impacts such as radio, television, and human speech. The IIC rating is often used for floor/ceiling assemblies to focus on structure-borne noise such as footfall or objects being dropped. The IBC specifies that a minimum STC or IIC rating of 50 is desired to provide a comfortable living environment.



Two class ratings help to measure interior noise thresholds.

2.2 State Regulations

2.2.1 State of California Noise Control Act

In 1975, the State of California established its own Noise Control Act located in Division 28 of the State's Health and Safety Code. Chapter 6, Assistance to Local Agencies, provides direction on how the state will assist each local agency in establishing local ordinances and policies:

Chapter 6. Assistance to Local Agencies

46060. It is the purpose of this chapter to encourage the enactment and enforcement of local ordinances in those areas which are most properly the responsibility of local government. It is further the purpose to insure that the state is of maximum assistance to local agencies in the discharge of those responsibilities, furnishing technical and legal expertise to assist local agencies in the enactment and enforcement of meaningful and technically sufficient noise abatement measures.

46061. The office shall provide technical assistance to local agencies in combating noise pollution. Such assistance shall include but not be limited to:

A. Advice concerning methods of noise abatement and control.
B. Advice on training of noise control personnel.
C. Advice on selection and operation of noise abatement equipment.

46062. The office shall provide assistance to local agencies in the preparation of model ordinances to control and abate noise. Such ordinances shall be developed in consultation with the Attorney General and with representatives of local agencies, including the County Supervisors Association of California and the League of California Cities. Any local agency which adopts any noise control ordinance shall promptly furnish a copy to the office.

2.2.2 State of California Building Code

The State of California's noise insulation standards are codified in the California Code of Regulations (CCR), Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of ensuring that the level of exterior noise transmitted to and received within the interior living spaces of buildings is compatible with their comfortable use. For new residential dwellings, hotels, motels, dormitories, and school classrooms, the acceptable interior noise limit for habitable rooms in new construction is 45 dBA CNEL or L_{dn}. Title 24 requires acoustical studies for residential development in areas exposed to more than 60 dBA CNEL to demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. Where exterior noise levels are projected to exceed 60 dBA CNEL or L_{dn} at the facade of a building, a report must be submitted with the building plans that describe the noise control measures that have been incorporated into the design of the project to meet the 45 dBA CNEL or L_{dn} noise limit.

2.2.3 California Green Building Code

The California Green Building Code, also referred to as CalGreen (ICC 2017), provides the following requirements under Environmental Comfort related to noise:

5.507.4 Acoustical control. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413 or Outdoor–Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

> **Exception:** Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirement of this section and all subsections apply only to new construction.

5.507.4.1 Exteriors noise transmission prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport (see figure with airport contours on page 3-33).

Exceptions:

a. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.

b. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dBL_{eq}-1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

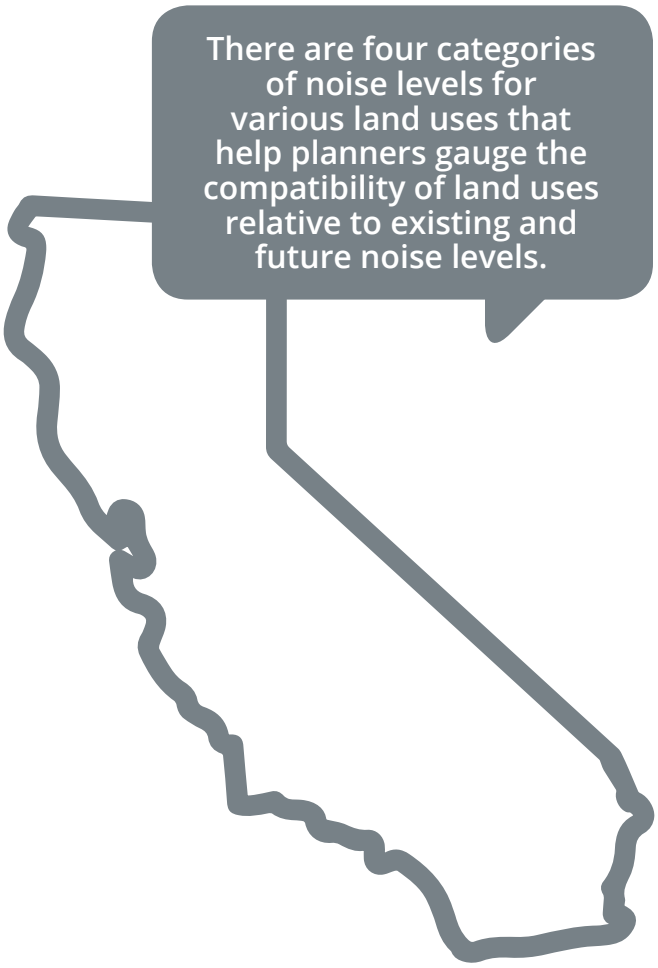
5.507.4.2 Performance method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq -1Hr) of 50 dBA in occupied areas during any hour of operation.

> ***5.507.4.2.1 Site features.*** Exterior features such as sound wall or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC or IIC of at least 40. For residential uses or sensitive tenant spaces, a minimum STC or IIC of 50. Note: Examples of assemblies and their various STC rating may be found at the California Office of Noise Control website.

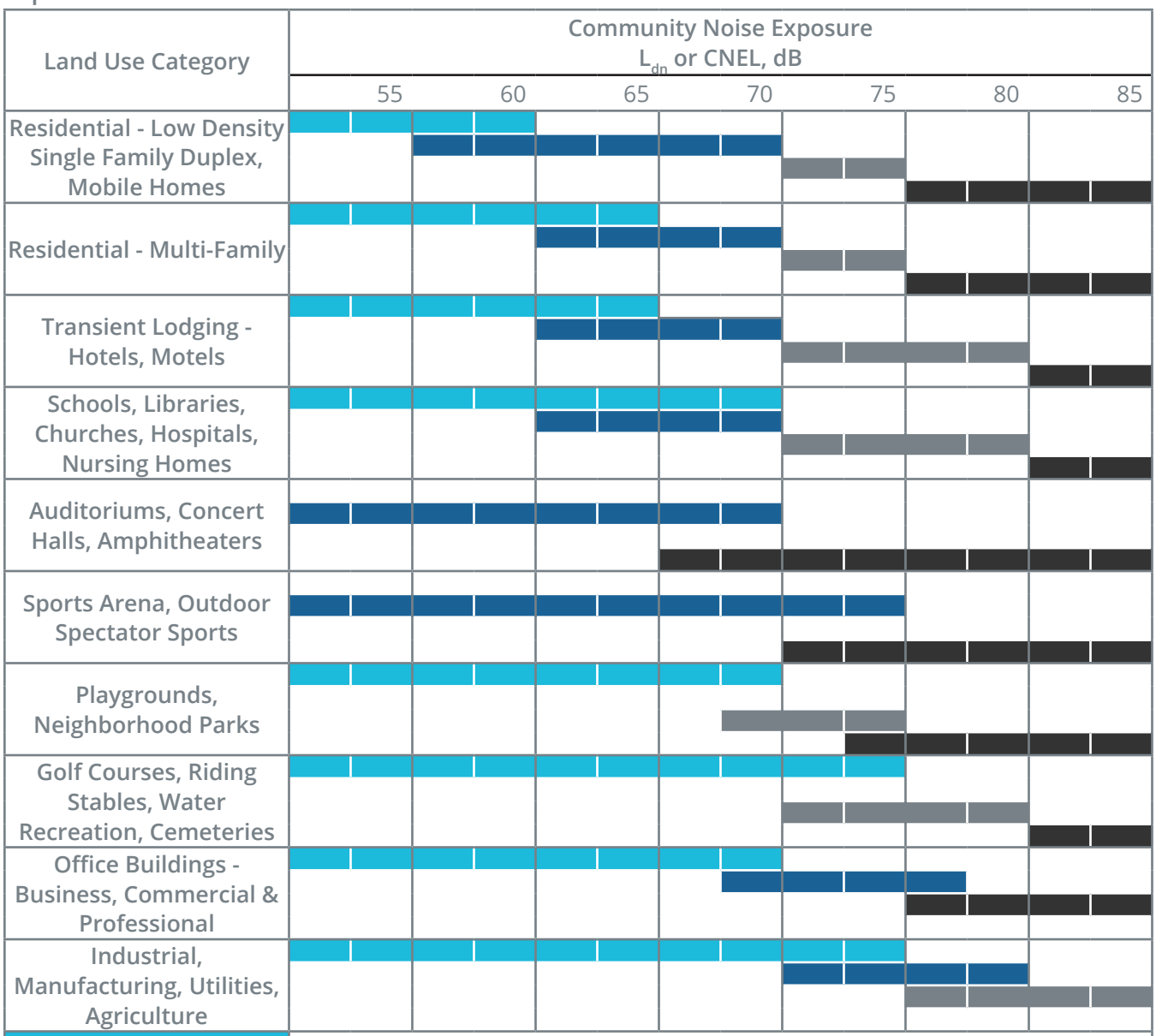
2.2.4 State of California Land Use Compatibility Criteria

The State of California adopts suggested land use noise compatibility levels as part of its General Plan Guidelines (California 2003). These suggested guidelines provide urban planners with an integral tool to gauge the compatibility of land uses relative to existing and future noise levels. The guidelines identify normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable noise levels for various land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated into the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements. The Land Use Compatibility Guidelines are shown in Table E.



State of California Land Use Compatibility Criteria.

Table E: California Office of Noise Control Land Use Compatibility Matrix for Community Noise Exposure



Normally Acceptable	*Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise*
Conditionally Acceptable	*New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.*
Normally Unacceptable	*New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.*
Clearly Unacceptable	*New construction or development should generally not be undertaken.*

Source: California Department of Health, Guidelines for the Preparation and Content of Noise Elements of the General Plan, October, 2003.

2.2.5 State of California Vehicle Code

Division 12, Equipment of Vehicles, Chapter 5, Other Equipment, Article 2, Exhaust Systems, and Article 2.5, Noise Limits, provide regulations related to noise levels associated with motor vehicles as follows.

Article 2. Exhaust Systems

27150. (a) Every motor vehicle subject to registration shall at all times be equipped with an adequate muffler in constant operation and properly maintained to prevent any excessive or unusual noise, and no muffler or exhaust system shall be equipped with a cutout, bypass, or similar device.

(b) Except as provided in Division 16.5 (commencing with Section 38000) with respect to off-highway motor vehicles subject to identification, every passenger vehicle operated off the highways shall at all times be equipped with an adequate muffler in constant operation and properly maintained so as to meet the requirements of Article 2.5 (commencing with Section 27200), and no muffler or exhaust system shall be equipped with a cutout, bypass, or similar device.

(c) The provisions of subdivision (b) shall not be applicable to passenger vehicles being operated off the highways in an organized racing or competitive event conducted under the auspices of a recognized sanctioning body or by permit issued by the local governmental authority having jurisdiction.

> ***27150.1.*** No person engaged in a business that involves the selling of motor vehicle exhaust systems, or parts thereof, including, but not limited to, mufflers, shall offer for sale, sell, or install, a motor vehicle exhaust system, or part thereof, including, but not limited to, a muffler, unless it meets the regulations and standards applicable pursuant to this article. Motor vehicle exhaust systems or parts thereof include, but are not limited to, nonoriginal exhaust equipment. A violation of this section is a misdemeanor.

Article 2.5. Noise Limits

27200. (a) The Department of Motor Vehicles shall not register on a dealer's report of sale a new motor vehicle, except an off-highway motor vehicle subject to identification as provided in Division 16.5 (commencing with Section 38000), which produces a maximum noise exceeding the applicable noise limit at a distance of 50 feet from the centerline of travel under test procedures established by the Department of the California Highway Patrol.

(b) The Department of Motor Vehicles may accept a dealer's certificate as proof of compliance with this article.

(c) Test procedures for compliance with this article shall be established by the Department of the California Highway Patrol, taking into consideration the test procedures of the Society of Automotive Engineers.

(d) No person shall sell or offer for sale a new motor vehicle, except an off-highway motor vehicle subject to identification as provided in Division 16.5 (commencing with Section 38000), which produces a maximum noise exceeding the applicable noise limit specified in this article, and for which noise emission standards or regulations have not been adopted by the Administrator of the Environmental Protection Agency pursuant to the Noise Control Act of 1972 (P.L. 92-574).

(e) No person shall sell or offer for sale a new motor vehicle, except an off-highway motor vehicle subject to identification as provided in Division 16.5 (commencing with Section 38000), which produces noise that exceeds or in any way violates the noise emission standards or regulations adopted for such a motor vehicle by the Administrator of the Environmental Protection Agency pursuant to the Noise Control Act of 1972 (P.L. 92-574).

(f) As used in this section, the term "register" is equivalent to the term "licensing" as used in Section 6(e)(2) of the Noise Control Act of 1972

27201. For the purposes of Section 27200, the noise limit of 92 dBA shall apply to any motorcycle manufactured before 1970.

27202. For the purposes of Section 27200, the following noise limits shall apply to any motorcycle, other than a motor-driven cycle, manufactured:

(1) After 1969, and before 1973 .....88 dBA
(2) After 1972, and before 1975 .....86 dBA
(3) After 1974, and before 1986 .....83 dBA
(4) After 1985 .....80 dBA

27202.1. (a) Notwithstanding any other law, a person shall not park, use, or operate a motorcycle, registered in the State of California, that does not bear the required applicable federal Environmental Protection Agency exhaust system label pursuant to Subparts D (commencing with Section 205.150) and E (commencing with Section 205.164) of Part 205 of Title 40 of the Code of Federal Regulations. A violation of this section shall be considered a mechanical violation and a peace officer shall not stop a motorcycle solely on a suspicion of a violation of this section. A peace officer shall cite a violation of this section as a secondary infraction.

(b) A violation of this section is punishable as follows:

(1) For a first conviction, by a fine of not less than fifty dollars ($50), nor more than one hundred dollars ($100).

(2) For a second or subsequent conviction, by a fine of not less than one hundred dollars ($100), nor more than two hundred fifty dollars ($250).

(c)

(1) The notice to appear issued or complaint filed for a violation of this section shall require that the person to whom the notice to appear is issued, or against whom the complaint is filed, produce proof of correction pursuant to Section 40150.

(2) Upon producing proof of correction to the satisfaction of the court, the court may dismiss the penalty imposed pursuant to subdivision (b) for a first violation of this section.

(d)

(1) This section is applicable to a person operating a motorcycle that is manufactured on or after January 1, 2013, or a motorcycle with aftermarket exhaust system equipment that is manufactured on or after January 1, 2013.

(2) Penalties imposed pursuant to this section are in addition to penalties imposed pursuant to any other applicable laws or regulations.

(3) This section does not supersede, negate, or otherwise alter any other applicable laws or regulations.

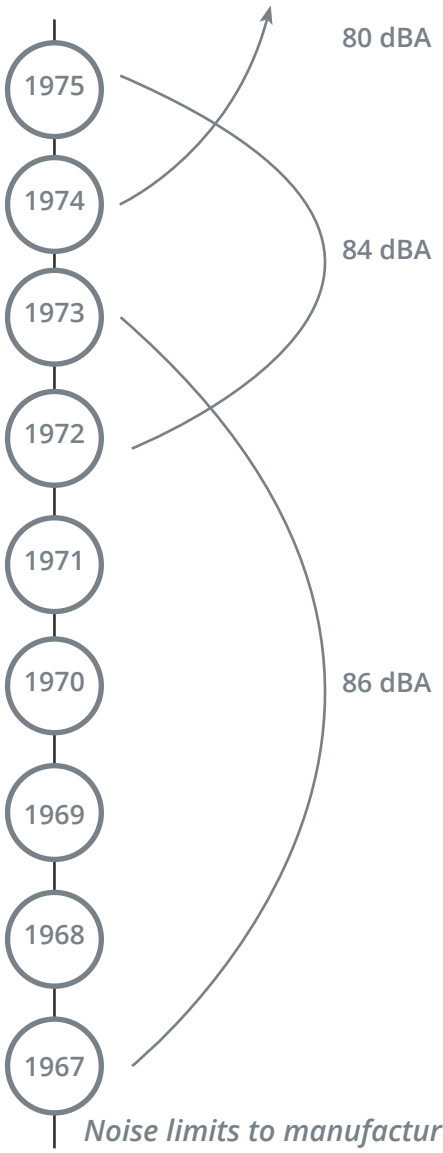
27203. For the purposes of Section 27200, the noise limit of 82 dBA shall apply to any snowmobile manufactured after 1972.

27204. For the purposes of Section 27200, the following noise limits shall apply to any motor vehicle within the specified manufacturer's gross vehicle weight rating and date of manufacture:

GVWR—Pounds	Date of Manufacture	Noise Limit—dBA
Over 6,000	after 1967 and before 1973	88
Over 6,000	after 1972 and before 1975	86
Over 6,000	after 1974 and before 1978	83
Over 8,500	after 1977 and before 1982	83
Over 6,000 but not over 8,500	after 1977	80
Over 8,500 but not over 8,500	after 1981	80
Over 10,000	after 1981 and before 1988	83
Over 10,000	after 1987	80

27206. For the purposes of Section 27200, the following noise limits shall apply to any other motor vehicle, not specified in this article, manufactured:
(1) After 1967, and before 1973 .....86 dBA
(2) After 1972, and before 1975 .....84 dBA
(3) After 1974 .....80 dBA

27207. No motor vehicle with a gross vehicle weight rating of more than 10,000 pounds and equipped with an engine speed governor shall produce a sound level exceeding 88 dBA, measured on an open site at a distance of 50 feet from the longitudinal centerline of the vehicle, when its engine is accelerated from idle with wide open throttle to governed speed with the vehicle stationary, transmission in neutral, and clutch, if any, engaged. Test procedures for compliance with this section shall be established by the department, taking into consideration the procedures of the United States Department of Transportation. The procedures may provide for measuring at other distances, in which case the measurement shall be corrected so as to provide for measurements equivalent to the noise limit established by this section measured at 50 feet.



Noise limits to manufactured vehicles

2.2.6 State of California Airport Land Use Requirements

The State of California has multiple regulations and standards that apply to airports. These are briefly summarized below:

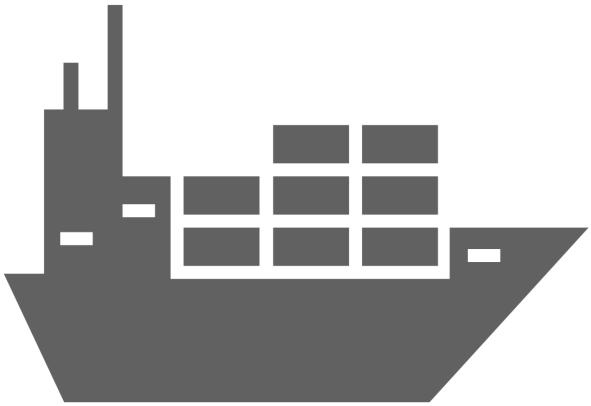
- The Aeronautics Division of the California State Department of Transportation (Caltrans)
- Enforces the California Airport Noise Regulations. These regulations establish 65 dB CNEL as the noise impact boundary within which there shall be no incompatible land uses. Airports are responsible for achieving compliance with these regulations. Compliance can be achieved through noise abatement alternatives, land acquisition, land use conversion, land use restrictions, or sound insulation of structures. Airports not in compliance can operate under variance procedures established within the regulations.
- California Noise Insulation Standards apply to all multi-family dwellings built in the State. Single-family residences are exempt from these regulations. The regulations require that all multi-family dwellings with exterior noise exposures greater that 60 dB CNEL must be sound insulated such that the interior noise level will not exceed 45 dB CNEL. These requirements apply to all roadway, rail, and airport noise sources.
- The State of California requires that all municipal General Plans contain a Noise Element. The requirements for the Noise Element of the General Plan include describing the noise environment quantitatively using a cumulative noise metric such as CNEL or DNL, establishing noise/land use compatibility criteria, and establishing programs for achieving and/or maintaining compatibility. Noise elements shall address all major noise sources in the community including mobile and stationary sources.
- Airport Land Use Commissions were created by State Law for the purpose of establishing a regional level of land use compatibility between airports and their surrounding environs. The Los Angeles County Airport Land Use Commission has adopted an Airport Environs Land Use Plan (AELUP) for Los Angeles County airports including Long Beach Airport. The AELUP criteria for sensitive land uses at 65 dB CNEL for outdoor areas and 45 dB CNEL for indoor areas of residential land uses.

2.2.7 State of California Motorized Watercraft Requirements

The State of California has established requirements and limits as it relates to noise associated with watercraft. Any motorized vessel operated on the inland waters of California or on ocean waters within one mile of the coastline must be muffled or otherwise prevented from exceeding the following noise levels:

- As measured using a stationary sound level test as defined by SAE J-2005:
  - 90 decibels if the engine was manufactured before January 1, 1993
  - 88 decibels if the engine was manufactured on or after January 1, 1993, or
- 75 decibels measured as defined by SAE J-1970 for all engines. However, such measurement shall not preclude a stationary sound level test as prescribed by SAE J-2005.

Exceptions to the above restrictions are made for vessels participating in permitted regattas, boat races or speed trials. Authorities generally agree that unbaffled exhaust pipes (stacks) and most water-injected pipes do not meet the above noise level requirements. Unmodified outboards usually meet legal requirements.



2.3 City of Long Beach

2.3.1 Existing Noise Element

2.3.1.1 Existing Standards

The City of Long Beach Noise Element considers the impacts of stationary noise producers. Stationary noise producers are entities with a fixed location that emit noise. The General Plan requires that sensitive land uses not be subjected to excessive stationary noise, either by mitigation at the source or through planning measures that reduce sound exposure. While the current General Plan does not contain a land use compatibility table, Table F summarizes the criteria for sensitive receivers.

Table F: City General Plan Recommended Criteria for Maximum Acceptable Noise Levels[1] in A-Weighted Decibels (dBA)

Major Land Use Type	Stationary Source Land Use Noise Standards			
	Outdoor			Indoor
	Maximum Single Hourly Peak	L_{10}[2]	L_{50}[3]	L_{dn}[4]
Residential[5] 7:00 a.m. to 10:00 p.m.	70	55	45	45
Residential[5] 10:00 p.m. to 7:00 a.m.	60	45	35	35
Commercial (anytime)	75	65	55	N/A
Industrial (anytime)	85	70	60	N/A

Source: City of Long Beach Noise Element (1975) Table 11
[1]Based on existing ambient level ranges in Long Beach and recommended U.S. Environmental Protection Agency ratios and standards for interference and annoyance.
[2]Noise levels exceeded 10 percent of the time.
[3]Noise levels exceeded 50 percent of the time.
[4]Day-night average sound level. The 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime levels.
[5]Includes all residential categories and all nose-sensitive land uses (e.g., hospitals and schools).

2.3.1.2 Goals, Plans, and Policies

One of the major functions of a General Plan Noise Element is to establish goals to strive for, plans to help achieve those goals, and polices which regulate both current and future developments and all activities within the City limits. In the current version of the City's Noise Element, found in detail on pages 140 through 176, these are referenced as Implementation Strategies, Categorical Recommendations, and Transportation Noise Reduction Measures.

2.3.2 Municipal Code

The City's Municipal Code is the document in which specific planning and enforcement noise criteria is presented such that, in conjunction with the City's Noise Element, noise impacts to sensitive receptors are minimized. The following describes the individual subsections and specific regulations:

2.3.2.1 General Noise Ordinance Standards

The City's Municipal Code (Section 8.80.160—Exterior noise limits) establishes maximum exterior sound level standards. Standards vary depending on land use. Table G outlines these criteria, which represent noise limits that no person shall exceed through sound they create or allow to be created.

Table G: Maximum Local Noise Criteria

Receiving Land Use District	Maximum Noise Criteria (dB L_{max})	
	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
District One — Predominantly residential with other land use types also present	50	45
District Two — Predominantly commercial with other land use types also present	60	55
District Three[1] — Predominantly industrial with other land use types also present	65	65
District Four[1] — Predominantly industrial with other land types use also present	70	70
District Five — Airport, freeways, and waterways regulated by other agencies	Regulated by other agencies and laws	

Source: City of Long Beach Municipal Code (1982)
[1]Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts.
dB = decibel(s)
L_{max} = maximum instantaneous noise level

The City's Municipal Code Section (8.80.180—Interior noise limits), establishes maximum interior sound level standards. Standards vary depending on land use. Table H outlines these criteria, which represent noise limits that no person shall exceed through sound they create or allow to be created.

B. No person shall operate, or cause to be operated, any source of sound indoors at any location within the incorporated limits of the City or allow the creation of any indoor noise which causes the noise level when measured inside the receiving dwelling unit to exceed:

1. The noise standard for that land use district as specified in Table G for a cumulative period of more than five (5) minutes in any hour; or
2. The noise standard plus five decibels (5 dB) for a cumulative period of more than one (1) minute in any hour; or
3. The noise standard plus ten decibels (10 dB) or the maximum measured ambient, for any period of time.

C. If the measured indoor ambient level exceeds that permissible within any of the first two (2) noise limit categories in this Section, the allowable noise exposure standard shall be increased in five decibel (5 dB) increments in each category as appropriate to reflect the indoor ambient noise level. In the event the indoor ambient noise level exceeds the third noise limit category, the maximum allowable indoor noise level under said category shall be increased to reflect the maximum indoor ambient noise level.

Table H: Interior Noise Limits

Receiving Land Use District	Type of Land Use	Time Interval	Allowable Interior Noise Level (dBA)
All	Residential	10:00 p.m.—7:00 a.m. 7:00 a.m.—10:00 p.m.	35 45
All	School	7:00 a.m.—10:00 p.m. (While school is in session)	45
Hospital, designated quiet zones, and noise-sensitive zones		Any time	40

Source: City of Long Beach Municipal Code (1982)
dBA = A-weighted decibel(s)

In 2009, ORD-09-0030 amended Section 8.80.160 of the Municipal Code to amend the Noise District Map, changing the portion of the City, north of the Long Beach Airport and west of Lakewood Boulevard from District One to District Two.

2.3.2.2 Title 5- Regulation of Businesses, Trades and Professions

The purpose of this title is to identify those businesses, trades and professions conducted and carried on in the City that require local regulation in order to promote and protect the public health, safety and welfare of the citizens. The purpose of this title is

1. to set forth the specific standards and criteria under which such businesses, trades and professions shall be conducted and regulated within the City and,
2. to set forth the procedures and conditions for applying for such a permit.

The following are the chapters and subsections that relate directly to noise impacts:

5.51.065—Ice Cream Trucks – Additional Noise Restrictions.

A. No person shall use, play or employ any sound, outcry, amplifier, loudspeaker or any other instrument or device for the production of sound from an ice cream truck when the ice cream truck is stationary.

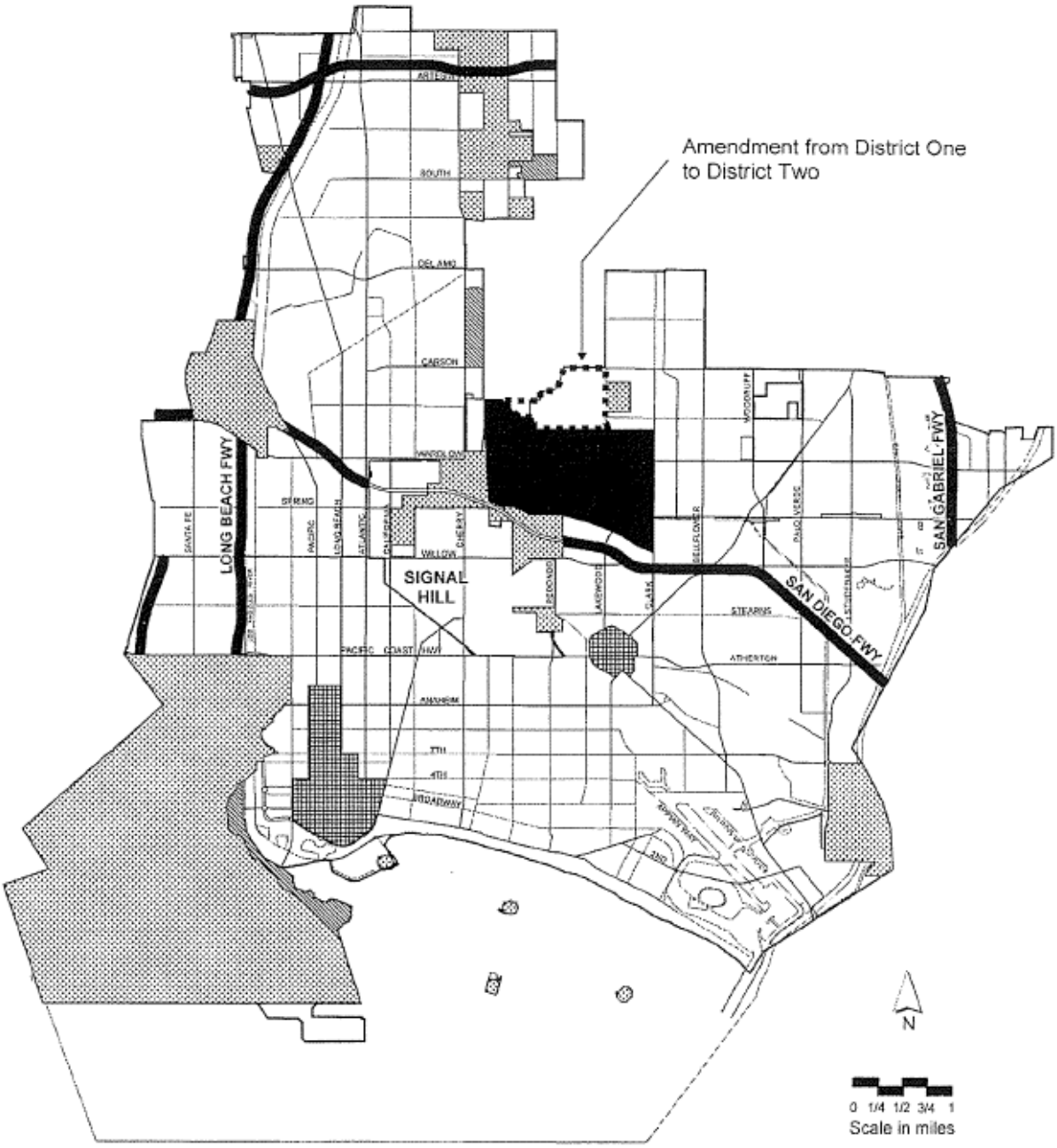
B. The City may set reasonable restrictions in the business license on the type and use of any amplifier, loudspeaker, or any other instrument or device for the production of sound employed on an ice cream truck in order to prevent a disturbance of the peace.

5.60.020—Special Events – Permit Required.

C. The City Manager may condition any permit issued pursuant to this Chapter with reasonable requirements concerning the time, place or manner of holding such event as is necessary to coordinate multiple uses of public property, assure preservation of public property and public places, prevent dangerous, unlawful or impermissible uses, protect the safety of persons and property and to control vehicular and pedestrian traffic in and around the venue. Conditions may include the use of sound amplification equipment, and restrictions on the amount of noise generated by motors and other equipment used in the course of the event.

Beach Streets Festival

NOISE DISTRICT MAP



* Noise at Long Beach Airport is regulated by State & Federal Laws. It is the responsibility of the Noise Control Officer to address complaints filed against aircraft noise, report all violations to proper enforcing agencies and the Long Beach City Council.

District 1 - Remainder of the City
District 2
District 3
District 4
District 5 - Preempted by other Agencies*

- 27 -

5.72.200, Subsection B.

11. Permittee agrees that the following standard is reasonable: Noise emanating from Permittee's premises shall not be unreasonably loud or disturbing in light of the facts and circumstances then prevailing within fifty feet (50') of the perimeter of the premises in all directions. Sound and amplification equipment shall be monitored during business hours to ensure that audible noise remains at acceptable levels in accordance with Long Beach Municipal Code Chapter 8.80.

12. On and after the date this ordinance takes effect, applicants for new entertainment permits in the ODED must cause an acoustical study to be prepared by a qualified, certified acoustical engineer, hired by the applicant and acceptable to the City, which shall demonstrate the sound emanating from the applicant's establishment meets the sound standards described in Long Beach Municipal Code Chapter 8.80. The study shall be reviewed and confirmed by the Health Department and the Development Services Department during their review of the permit application.

5.72.121, Subsection D.2.—Permit Application Filing and Process for Adult Entertainment.

g. The premises within which the entertainment is located shall provide sufficient sound absorbing insulation so that noise generated inside the premises shall not be audible anywhere on the adjacent property or public rights-of-way or within any other building or other separate unit within the same building.

Long Beach Grand Prix

5.72.200, Subsection B.—Downtown Dining and Entertainment District.

11. Permittee agrees that the following standard is reasonable: Noise emanating from Permittee's premises shall not be unreasonably loud or disturbing in light of the facts and circumstances then prevailing within fifty feet (50') of the perimeter of the premises in all directions. Sound and amplification equipment shall be monitored during business hours to ensure that audible noise remains at acceptable levels in accordance with Long Beach Municipal Code Chapter 8.80.

12. On and after the date this ordinance takes effect, applicants for new entertainment permits in the ODED must cause an acoustical study to be prepared by a qualified, certified acoustical engineer, hired by the applicant and acceptable to the City, which shall demonstrate the sound emanating from the applicant's establishment meets the sound standards described in Long Beach Municipal Code Chapter 8.80. The study shall be reviewed and confirmed by the Health Department and the Development Services Department during their review of the permit application.

Beach Streets Festival

2.3.2.3 Title 6- Animals

The purpose of this title is to identify animal regulations within the City. The following are the chapters and subsections that relate directly to noise impacts:

6.16.110—Dog Noise—Prohibited.

No person responsible for a dog shall permit such dog to bark, howl, whine and/or make other loud and unusual noises, whether within a building or enclosure, tied, or otherwise confined, or while at large upon any public street, sidewalk, improvement, park or other public place, or private property, which disrupts the public peace or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

6.16.120—Dog Noise—Enforcement.

When the Director or his/her enforcement officer(s) and/or inspector(s) determine that a person responsible for a dog has violated Section 6.16.110 of this Code, such Animal Care Services Bureau personnel are authorized to:

A. Direct the person responsible for the dog to immediately terminate the actions of the dog that are causing the loud noise;

B. Issue a written notice to the person responsible that if, within a twelve (12) month period following the initial response. Animal Care Services Bureau personnel are again required to respond to the same person responsible for violating Section 6.16.110 of this Code, a criminal and/or administrative citation will be issued pursuant to Chapters 1.32 and 6.16 of this Code; and

C. Issue criminal and/or administrative citations to the person responsible for recurrent violations of Section 6.16.110 of this Code within a twelve (12) month period.

2.3.2.4 Title 8- Health and Safety

Chapter 8.80 within Title 8 provides a variety of subsections regarding to noise standards within the City. The following subsections highlight the information used on a daily basis by the planning department to control noise impacts:

8.80.050 - Noise Control Officer—Duties.

In order to effectively implement and enforce this Chapter, the Noise Control Officer shall, within a reasonable time:

A. Investigate and Pursue Violations. Investigate and pursue possible violations of this Chapter;

B. Delegation of Authority. Delegate functions, where appropriate under this Chapter, to personnel within the noise control office and to other departments, subject to the approval of the City Manager;

C. Community Noise Element.

1. Assist in the preparation or revision thereof of the City noise element of the general plan as required by Government Code Section 65302 (g), following guidelines set forth by the State Office of Noise Control,
2. Assist in or review the total transportation planning of the City, including planning for new roads and highways, bus routes, airports, and other systems for public transportation, to insure that proper consideration is taken with regard to the impact of sound levels and that the policies set forth in the noise element are adhered to,
3. Provide ongoing assistance to local agencies in determining possible mitigating measures for current or future noise problems;

D. Airport Noise Exposure. Assist the department of aeronautics in developing a plan for noise compatible land use in the vicinity of the Long Beach Airport and maintain consistency with the provisions and policies of the noise element of the general plan;

E. State and Federal Laws and Regulations.

1. Prepare and publish with the approval of the City Council a list of those products manufactured to meet specified noise emission limits under federal, State or community law for which tampering enforcement will be conducted, and
2. Make recommendations for modification or amendments to this Chapter to insure consistency with all State and federal laws and regulations;
3. Administer Grants, Funds and Gifts. Administer noise program grants, funds and gifts from public and private sources, including the State and federal governments;

F. Monitoring Responsibilities. Notwithstanding the preemption by federal and State agencies of the enforcement powers over certain activities, such as those at the Long Beach Airport and at the Long Beach Marine Stadium, the Noise Control Officer shall monitor noise generated by such preempted activities and report any violations of State or federal regulations to the appropriate enforcement agencies and to the City Council.

8.80.080—City departments—Legal compliance.

All departments engaged in any activities which result or may result in the emission of noise, shall comply with federal and State laws and regulations, as well as the provisions of this Chapter, respecting the control and abatement of noise to the same extent that any person is subject to such laws and regulations.

8.80.180—Interior noise limits—Correction for character of sound.

In the event the alleged offensive noise contains a steady audible tone such as a whine, screech or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech conveying information content, the standard limits set forth in Table C in Section 8.80.170 shall be reduced by five decibels (5 dB).

8.80.202—Construction activity—Noise regulations.

The following regulations shall apply only to construction activities where a building or other related permit is required or was issued by the Building Official and shall not apply to any construction activities within the Long Beach harbor district as established pursuant to Section 201 of the City Charter.

A. Weekdays and federal holidays. No person shall operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling, demolition or any other related building activity which produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity between the hours of seven p.m. and seven a.m. the following day on weekdays, except for emergency work authorized by the Building Official. For purposes of this Section, a federal holiday shall be considered a weekday.

B. Saturdays. No person shall operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling, demolition or any other related building activity which produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity between the hours of seven p.m. on Friday and nine a.m. on Saturday and after six p.m. on Saturday, except for emergency work authorized by the Building Official.

C. Sundays. No person shall operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling, demolition or any other related building activity at any time on Sunday, except for emergency work authorized by the Building Official or except for work authorized by permit issued by the Noise Control Officer.

Construction Activity Operational Hours

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
If authorized by the Building Official	7 a.m. to 7 p.m.	7 a.m. to 7 p.m.	7 a.m. to 7 p.m.	7 a.m. to 7 p.m.	7 a.m. to 7 p.m.	9 a.m. to 6 p.m.

D. Owner's/employer's responsibility. It is unlawful for the landowner, construction company owner, contractor, subcontractor or employer of persons working, laboring, building, or assisting in construction to permit construction activities in violation of provisions in this Section.

E. Sunday work permits. Any person who wants to do construction work on a Sunday must apply for a work permit from the Noise Control Officer. The Noise Control Officer may issue a Sunday work permit if there is good cause shown; and in issuing such a permit, consideration will be given to the nature of the work and its proximity to residential areas. The permit may allow work on Sundays, only between nine a.m. and six p.m., and it shall designate the specific dates when it is allowed.

F. Enforcement. Notwithstanding the provisions of Sections 8.80.370 and 8.80.380, this Section may be enforced by a Police Officer.

8.80.210—Refuse collection vehicles.

No person shall collect refuse with a refuse collection vehicle between the hours of seven p.m. and seven a.m. the following day in a residential area or noise sensitive zone.

8.80.220—Motor vehicle horns.

It is unlawful for any person within the City to sound a vehicular horn within any residential zone except as a warning signal, as provided in the Vehicle Code of the State.

8.80.240—Vehicle, motorboat or aircraft repair and testing.

A. Repairing, rebuilding, modifying or testing any motor vehicle, motorboat or aircraft in such a manner as to create a noise disturbance across a residential real property line, or at any time to violate the provisions of Sections 8.80.150 or 8.80.170 shall not be permitted except where said activities are directly related to officially sanctioned events.

B. This provision shall not apply to aircraft within the airport property or within any other aviation-related property abutting it.

2.3.2.5 Title 9- Public Peace, Morals and Welfare

Chapter 9.31 within Title 9 provides information related to noise impacts created by loud parties on private property. The following subsection establishes the prohibited noise impacts:

9.31.010—Loud Noises Prohibited.

No person shall cause or permit loud music or other noises caused by a party, gathering or assemblage of persons on private property to disrupt the public peace. Noise that is audible from a distance of fifty feet (50') or more from the property shall be deemed to disrupt the public peace. Any person who causes or permits any such loud music or other noises is guilty of a public offense punishable under the provisions of Title 1, Chapter 1.32 of this Code.

2.3.2.6 Title 10- Vehicles and Traffic

Chapter 10.25 within Title 10 provides information related to noise impacts created by car alarms. The following subsection establishes the violations and penalties:

10.25.010—Motor vehicle alarms—Violations—Penalties.

B. No person shall cause, allow, permit or suffer any alarm located in a motor vehicle registered in the name of or operated by such person to emit any continuous or intermittent audible sound in the City for a period of more than fifteen (15) minutes. The time shall be calculated based upon the emission of the first audible sound and ending fifteen (15) minutes thereafter notwithstanding any variation or delay in the emissions of audible sound.

2.3.2.7 Title 12- Long Beach Oil Code

Chapters 12.12 and 12.30 within Title 12 provide information related to oil operations. The following subsections establish hours of operation as well and noise requirements:

12.12.060—Long Beach Oil Code, Special Conditions—Generally.

G. Hours of Operation. All site work, operation of any tools or equipment used for the construction, alteration, repair, remodel, drilling, demolition, delivery of equipment or materials attendant to the preparation of a new drill, site maintenance or any other related oil site activities that produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity are permitted only between the days and hours listed below:

- Weekdays and Federal Holidays: Between the hours of 7:00 a.m. and 7:00 p.m.
- Saturdays: Between the hours of 9:00 a.m. and 6:00 p.m.
- Sundays: Prohibited

Exception: Except in case of emergency work that is required to avert a disaster at the well site or off-site piping associated to the well ope ration.

12.32.010—Excessive Noise Prohibited.

It is unlawful for any person to operate or cause to be operated any oil production or gas processing equipment on any well, or incidental to a well, within the incorporated limits of the City in any manner so as to create any noise which causes the exterior and interior noise level at the receiving property to be in excess of those limits provided in Chapter 8.80.

12.32.020—Areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and 24.

A. No person, either as owner, agent, or operator, shall conduct any drilling, or redrilling operation at any well located within oil operating areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and/or 24 in any manner so as to create any noise which causes the exterior noise level when measured at the property line of any single- or multiple-family dwelling unit, guest room, commercial building, school, hospital, church, or public library to exceed the noise level standards set forth in Table 1. The exterior noise level generated by the drilling or redrilling operation shall be continuously monitored to ensure conformance to the noise level standards. The costs of such monitoring shall be borne by the operator conducting such operation.

No person, either as owner, agent, or operator, shall conduct any drilling or redrilling operation at any time at any well located in oil operating areas 5, 6, 7A, 7B, 8, 9, 12, 13, 16, 18, 19, 21, 22, 23 and/or 24 in any manner so as to create any noise which causes the interior noise level in excess of those limits provided in Chapter 8.80.

If the existing ambient noise level, exclusive of existing drilling activity, at the nearest adjacent dwelling unit, guest room, commercial building, school, hospital, church or public library property line to the requested oil drilling site does not exceed the permitted nighttime noise levels in Table 1 for any period, then the following regulations shall apply:

1. The only activity permitted between the hours of seven p.m. (7:00 p.m.) and seven a.m. (7:00 a.m.) will be "on bottom" drilling, with single joint connections. During the same time frame, none of the following will be allowed:

a. Hammering on pipe;
b. Racking of pipe;
c. Acceleration and deceleration of engines or motors;
d. Use of drilling assembly rotational speeds that cause more noise than necessary and could reasonably be reduced by use of a slower rotational speed;
e. Picking up or laying down drill pipe, casing, tubing or rods into or out of the drill hole.

2. If the measured ambient level exceeds that permissible within any of the first four (4) noise limit categories in Table 1 above, the allowable noise exposure standard shall be increased in five (5) decibel increments in each affected category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth (5th) noise limit category, the maximum allowable noise level under said category shall be increased to equal the maximum ambient noise level.
3. If the difference between the noise levels with noise source operating and not operating is four (4) decibels or greater, then the noise measurement of the alleged source can be considered valid with a correction applied to account for the contribution of the ambient noise. The correction is to be applied in accordance with data shown in Table 2.

2.3.2.8 Title 14- Streets and Sidewalks

Chapter 14.24.040 provides information regarding unnecessary railroad noise.

14.24.040—Railroads Obstructing Streets, Section 14.24.040—Unnecessary noise.

No person shall allow the ringing of engine bells and the blowing of engine whistles when not in motion and unnecessarily.

2.3.2.9 Title 16- Public Facilities

Chapter 16.43, Airport Noise Compatibility.

This chapter provides information regarding airport noise requirements. The following subsections provide more specific information:

16.43.030—Prohibited activities.

A. Training Operations. No Touch and Go, Stop and Go, Practice Low Approach, or VFR Practice Missed Approach shall be conducted at the Airport except between seven a.m. and seven p.m. on weekdays and between eight a.m. and three p.m. on Saturdays, Sundays, New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day; provided, however, that if any such holiday falls on Saturday or Sunday and, as a result, a holiday is observed on the preceding Friday or succeeding Monday, then such Friday or Monday, as the case may be, shall be considered to be a holiday for purposes of this Section. Except for instrument training, Training Operations shall be conducted only on Runways 25R/7L and 25L/7R, unless the FAA directs such Operations on Runways 34L/16R and 34R/16L.

B. Engine Runups. Engine runups shall be permitted only between the hours of seven a.m. and nine p.m. on weekdays and nine a.m. and nine p.m. on weekends and holidays. Such runups may be conducted only at locations designated for such purposes by the Airport Manager. Nothing in this Section shall be deemed to require relocation of existing runup facilities for which appropriate noise buffering devices have been constructed.

C. Formation Takeoffs and Landings. Except as necessary in the manufacture or repair of aircraft, formation takeoffs and landings are prohibited at Long Beach Municipal Airport.

D. Unapproved Charter Flights. No proposed charter operation shall be conducted unless the written permission of the Airport Manager has been sought and received before such operation is scheduled to occur.

16.43.040—Maximum SENEL limits.

A. Subject to the authority of the Airport Manager to adjust permissible single event noise limits for categories of Airport users in order to reduce such group's cumulative noise levels, all non-governmental Operations at the Airport shall meet the following SENEL limits:

	7:00 a.m. to 10:00 p.m.	10:00 p.m. to 11:00 p.m. and 6:00 a.m. to 7:00 a.m.	11:00 p.m. and 6:00 a.m.	Monitoring Station No.
Runway	Departure/Arrival	Departure/Arrival	Departure/Arrival	Departure/Arrival
30	102.5/101.5	90/90	79/79	9/10
12	102.5/101.5	90/90	79/79	10/9
25R	92/88	*/	*/	6/1
25L	95/93	*/	*/	5/2
7R	95/92	*/	*/	2/5
7L	88/92	*/	*/	1/6
**Except in case of emergency or air traffic direction, all aircraft Operations between the hours of 10:00 p.m. and 7:00 a.m. are limited to runways 30 and 12.*				

B. Violations occurring during the period between ten p.m. and eleven p.m. which are the result of unanticipated delays beyond their reasonable control of the aircraft Owner/Operator shall be waived upon the presentation of evidence satisfactory to the Airport Manager that the delayed arrival or departure resulted from such circumstances. Delays caused by mechanical failure (but not by routine maintenance), by weather conditions or by air traffic control conditions will be considered beyond the Owner/Operator's control.

C. The SENEL limits for the period from six a.m. to seven a.m. and from ten p.m. to eleven p.m. shall be subject to revision at the end of the fourth calendar quarter following the implementation of this Chapter. If, for the period covered by the four (4) calendar quarters following implementation of this Chapter, cumulative aircraft noise has exceeded the level allowed by Subsection 16.43.050.A, these limits shall be reduced to eighty-five (85) SENEL. The SENEL for the period from six a.m. to seven a.m. and from ten p.m. to eleven p.m. shall, however, revert to ninety (90) SENEL if, for any subsequent four (4) quarters, cumulative aircraft noise has not exceeded the level allowed by Subsection 16.43.050.A.

16.43.050. Cumulative noise limits and noise budgets. It is the goal of the City that Incompatible Property in the vicinity of the Airport shall not be exposed to noise above sixty-five (65) CNEL. In determining compliance with this noise goal and with the noise budgets established by this Chapter, a tolerance of one (1) dB CNEL will be applied. In assessing cumulative noise levels for any period less than one (1) year, the Airport Manager shall take into consideration and allow for reasonably anticipated seasonal variations in Operations and noise. The noise of military and Public Aircraft, for which the City bears no liability, will be excluded in calculating CNEL and in assessing compliance with the CNEL goal and CNEL budgets set forth in this Chapter.

Industrial Operations. B.1. Pending assessment of compliance with the CNEL budget applicable to Industrial Operations, the number of annual Flights by that user group shall not be increased above the number for the twelve (12) months ended October 31, 1990, as adjusted to accommodate Flights for manufacturing and test purposes by aircraft types which were under design during the period from November 1, 1989, to October 31, 1990, but had not yet entered service.

Charter Operations. C1. In order to minimize noise from Charter Operations, all Charter Operations shall be conducted by aircraft which comply with the standards of FAR Part 36 Stage 3 and all Charter Operations shall be scheduled between the hours of seven a.m. and ten p.m.

Commuter Flights. D.1. Commuter Carriers shall be permitted to operate not less than twenty-five (25) flights per day, the number of Flights authorized on November 5, 1990. Pending assessment of compliance with the CNEL budget applicable to Commuter Carriers, Flights by these users shall not be increased above the number permitted as of November 5, 1990.

Air Carrier Flights. E.1. Air Carriers shall be permitted to operate not less than forty-one (41) flights per day, the number of flights authorized on November 5, 1990. Pending assessment of compliance with the CNEL budget applicable to Air Carriers, Flights by these users shall not be increased above the number permitted as of November 5, 1990.

2.3.2.10 Vibration Standards

8.80.200—Noise Disturbances—Acts specified G. Vibration.

Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (150') (forty-six (46) meters) from the source if on a public space or public right-of-way. For the purposes of this subsection, "vibration perception threshold" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such directed means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold shall be presumed to be .001 g's, g is the equivalent to 9.81 m/s2, in the frequency range 0—30 hertz and .003 g's in the frequency range between thirty and one hundred hertz.

2.3.3 Noise Complaint Procedures

Currently, the City has established a process in which noise complaints are responded to and dealt with in a timely fashion. The Noise Complaint Processing Network is a designed system in order to direct complaints to the appropriate personnel depending on the nature of the complaint. The current sub groups within the network include the Health and Safety Department, Department of Construction, Police Department, Public Works, Animal Control and Planning. Specific information on filing a noise complaint is found of the City's Health and Human Services Website at http://www.longbeach.gov/health/inspections-and-reporting/reporting/noise-monitoring/.

Noise Complaint Processing Network

- Health and Safety Department
- Department of Construction
- Police Department
- Public Works
- Animal Control
- Planning

Go to the Health and Human Services Website for information on filing a noise complaint:

http://www.longbeach.gov/health/inspections-and-reporting/reporting/noise-monitoring/

2.3.4 City Noise Regulation Efforts

In addition to the standards presented above taken from the current Noise Element and Municipal Code, the City makes a continual effort to regulate noise and create buffers from sources of noise to surrounding sensitive receptors and land uses. Enforcement of the regulations identified in this chapter is ongoing, and efforts are made to inform the public through a variety of means, such as information bulletins. For example, Information Bulletin BU-027 – Construction Noise Regulations provided by the Building and Safety Bureau – summarizes construction regulations including those contained in LBMC §8.80.202 establishing construction hours when noise is permitted and prohibited.

Through the review of projects in compliance with the California Environmental Quality Act (CEQA), noise mitigation measures are prescribed through approved Mitigation and Monitoring Programs to limit excessive noise. The CEQA process provides a tailored environmental analysis to address project-specific impacts and individual context. Below is a brief discussion identifying noise mitigation measures that could be employed for a project. Examples of noise mitigation measures are drawn from recent development projects including:

- Downtown Plan and Civic Center Project Mitigation Monitoring and Reporting Program (MMRP)
  - http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=5574
- Midtown Specific Plan MMRP
  - http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=5765

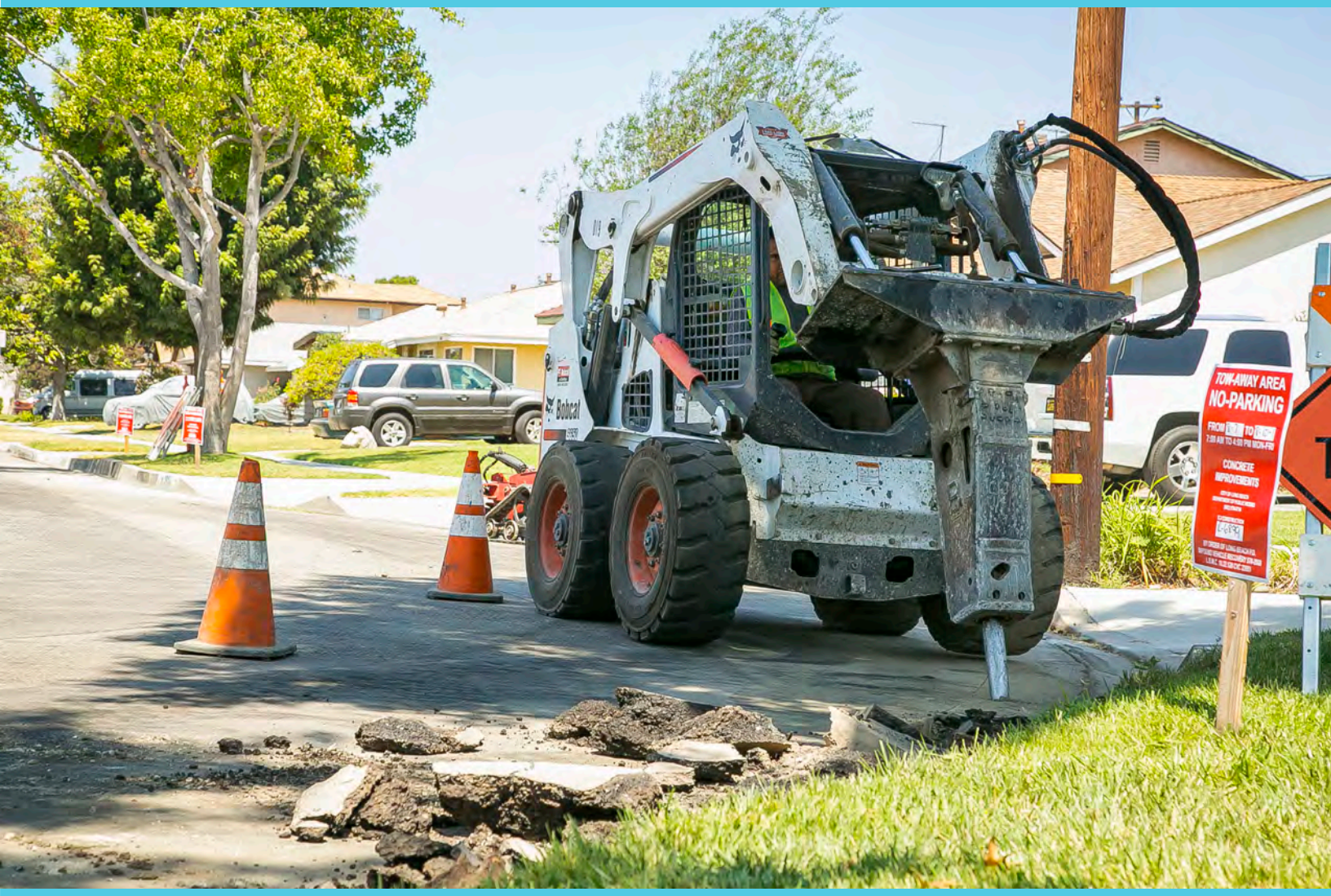
Noise mitigations are typically divided into measures addressing construction activities and measures addressing project design and operation. For construction noise, potential mitigation measures include equipment mufflers, quieter models of air compressors, locating stationary noise-generating equipment farther from sensitive receptors, no unnecessary idling of internal combustion equipment, routing construction-related traffic away from sensitive receptors, hours of loading/unloading, 150-foot radius noticing for construction activities, establishing a construction liaison to respond to noise complaints and provide corrections, provision of temporary noise barriers or blankets, and site-specific vibration mitigation.

For project design and operation noise mitigation, potential mitigation measures include appropriate site planning (for example, locating shared residential spaces behind buildings to reduce noise exposure), mechanical ventilation in residential areas in higher noise areas to allow for closed windows if desired, installation of sound-rated windows and construction methods, strategic placement of loading/unloading areas, placement of HVAC in mechanical rooms whenever possible, and provision of localized noise barriers or rooftop parapets around mechanical equipment.

A goal of the Noise Element effort is to further identify and standardize potential noise mitigation policies and tools to minimize and manage noise citywide.

Existing Noise Analysis

3



3 Existing Noise Analysis

» 3.1 Existing Noise Monitoring Results 3-1
» 3.2 Existing Traffic Noise Contours 3-1
» 3.3 Existing Airport Noise Contours.....3-32
» 3.4 Existing Noise and Land Use Compatibility Discussion.....3-32
» 3.5 References 3-34

3.0 EXISTING NOISE ANALYSIS

3.1 Existing Noise Monitoring Results

Noise measurements were taken in February 2014 and May 2017 to record the actual existing noise levels at various locations throughout the City. The noise measurements represent a snapshot of the current noise environment in the City. A noise measurement survey of the City was conducted to determine the location of noise measurement sites that would provide a noise profile of the City. Several criteria were used in the site selection process including, but not limited to, the proximity of a measurement site to sensitive land uses as well as its proximity to significant noise generators. Several of the significant noise generators within the City are I-405, I 710, SR-91, SR-1, and Long Beach Boulevard. This is due to the very high volume of automobile and truck traffic at these freeways and roadways. To provide noise measurement coverage of the area, measurement sites were chosen within the confines of the City. After the site selection process was completed, a series of long-term 24-hour and short-term noise 15-minute measurements were taken at the chosen sites. The measurement site locations are listed in Tables I and J and are shown on Figure 2, Noise Monitoring Locations.

3.2 Existing Traffic Noise Contours

The noise model SoundPlan was used to evaluate traffic-related noise conditions throughout the City. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the Ldn contours. Existing traffic volumes (SCAG 2017) were used to assess existing traffic noise levels in the City. Appendix A provides a summary of the traffic data utilized to create the existing traffic noise contours (Figure 3, Existing Noise Contours – pages 3-14 through 3-19 for composite mapping of all contours and pages 3-20 through 3-33 for larger scale mapping of 65 dBA L_{dn} and 75 dBA L_{dn} contours).

Table I: Existing Long-Term 48-Hour Noise Level Measurements

			Day 1			Day 2			Average	
Site No.	Start Date	Location	Daytime Noise Level Range (dBA L_{eq})	Nighttime Noise Level Range (dBA L_{eq})	Daily Noise Level (dBA CNEL)	Daytime Noise Level Range (dBA L_{eq})	Nighttime Noise Level Range (dBA L_{eq})	Daily Noise Level (dBA CNEL)	Daily Noise Level (dBA CNEL)	Source(s) of Noise
LT-01	5/12/2017	305 Newport Avenue	53.2–61.5	42.2–52.6	58.6	49.9–63.1	43.7–53.1	58.8	58.7	Traffic on Newport and 3rd Street.
LT-02	5/17/2017	3386 Elm Avenue	58.3–64.1	53.4–59.4	64.7	58.7–63.9	52.9–61.6	65.2	64.9	Traffic on I-405 and Wardlow Road and some aircraft.
LT-03	5/17/2017	Orizaba Avenue and East 67th Street	62.0–67.6	61.0–66.4	70.7	62.1–65.6	61.0–66.6	70.8	70.8	Traffic on SR-91.
LT-04	5/17/2017	2603 Studebaker Road	66.4–69.9	52.1–68.0	69.9	66.3–69.6	53.6–67.1	69.7	69.8	Traffic on Studebaker Road and Willow Street.
LT-05	5/17/2017	6463 Bixby Terrace Drive	66.2–67.8	57.3–67.8	71.0	66.2–67.7	58.1–67.1	71.0	71.0	Traffic on 7th Street.
LT-06	5/15/2017	2001 River Avenue	67.0–70.3	59.0–70.5	72.0	65.2–72.1	55.9–64.3	70.2	71.1	Traffic on SR-103 and SR-1, idling trucks, industrial activity, and aircraft.
LT-07	5/15/2017	1222 West Spring Street	67.2–70.8	62.9–69.6	74.0	68.0–70.1	63.5–70.0	73.9	73.9	Traffic on I-710 and aircraft.
LT-08	5/12/2017	151 South Pine Avenue	61.2–66.1	56.3–64.5	68.8	61.3–67.1	56.3–65.3	69.4	69.1	Traffic on Shoreline Drive and Pine Avenue.
LT-09	5/12/2017	215 Granada Avenue	53.6–60.3	45.1–54.4	59.6	51.6–59.4	44.2–54.1	59.6	59.6	Traffic on Granada Avenue and Second Street.

Table I: Existing Long-Term 48-Hour Noise Level Measurements (continued)

			Day 1			Day 2			Average	
Site No.	Start Date	Location	Daytime Noise Level Range (dBA L_{eq})	Nighttime Noise Level Range (dBA L_{eq})	Daily Noise Level (dBA CNEL)	Daytime Noise Level Range (dBA L_{eq})	Nighttime Noise Level Range (dBA L_{eq})	Daily Noise Level (dBA CNEL)	Daily Noise Level (dBA CNEL)	Source(s) of Noise
LT-10	5/12/2017	460 Long Beach Boulevard	64.7–71.2	58.3–65.7	71.3	63.1–69.0	56.9–65.7	71.1	71.2	Light rail and traffic on Long Beach Boulevard and 4th Street.
LT-11	5/15/2017	2250 Arlington Street	54.3–60.5	55.1–58.9	64.3	53.8–59.6	48.1–55.8	59.9	62.1	Traffic on I-405 and airplanes.
LT-12	5/17/2017	256 East Vernon Street	57.6–65.4	49.2–60.1	62.2	57.8–60.1	49.9–60.5	63.0	62.6	Traffic on Long Beach Boulevard and Willow Street, trains, construction, and aircraft.
LT-13	5/15/2017	Del Mar Avenue and San Antonio Drive	65.3–67.5	58.1–68.4	71.1	65.4–70.8	52.6–65.4	69.6	70.3	Traffic on I-710, trains, and traffic on Del Mar Avenue.
LT-14	5/15/2017	Del Mar Avenue and Avery Place	58.2–66.4	50.9–58.8	63.6	57.6–64.7	48.5–57.5	62.3	63.0	Traffic on I-710, trains, and traffic on Del Mar Avenue.

Source: LSA (2017).
L_{eq} = average noise level
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibel(s)
ft = feet
I-405 = Interstate 405
I-710 = Interstate 710
SR-1 = State Route 1
SR-91 = State Route 91
SR-103 = State Route 103

Table J: Existing Short-Term Noise Level Measurements

Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-1	2/11/2016	7:27 a.m.	66.6	6857–6909 Atlantic Avenue	Traffic on Atlantic Avenue, faint traffic on I-710, and trucks with trailers turning in nearby lot.	Paused out pedestrian pass-by talking loudly.
ST-2	2/11/2016	7:58 a.m.	70.3	3114 South Street	Traffic on South Street and birds.	None.
ST-3	2/11/2016	8:58 a.m.	63.6	3115 Long Beach Boulevard	Traffic on Long Beach Boulevard, backup beeper across Long Beach Boulevard, and birds.	Airplane: 15 seconds, 70 L_{eq}.
ST-4	2/11/2016	9:35 a.m.	65.7	1940 Long Beach Boulevard	Traffic on Long Beach Boulevard, birds, and distant music.	Paused out pedestrian pass-bys. Train on Long Beach Boulevard: 5 seconds, 68 L_{eq}/3 seconds, 70 L_{eq}.
ST-5	2/11/2016	10:13 a.m.	63.3	614 Locust Avenue	Traffic on 6th Street and birds.	Paused out sirens and pedestrians.
ST-6	2/11/2016	10:51 a.m.	64.0	600 Redondo Avenue	Traffic on Redondo Avenue. Car with loud music pass-by.	Airplane, paused out car in parking lot, motorcycle, helicopter.
ST-7	2/11/2016	2:11 p.m.	62.3	5800–6462 East Marina Drive	Traffic on 2nd Street and birds.	Paused out cars on Marina Drive. 2nd Street level is ~10 ft higher than measurement location level.
ST-8	2/11/2016	1:15 p.m.	66.0	Cal State University Long Beach, Bellflower Boulevard and Beach Drive	Traffic on Bellflower Boulevard, birds, and music in car/horn.	Airplane: 7 seconds, 63 dB/23 seconds, 63 dB.
ST-9	2/11/2016	11:42 a.m.	62.0	3500 Hathaway Avenue	Traffic on Hathaway Avenue and distant music in apartment.	Airplane: 35 seconds, 54 L_{eq}/8 seconds; 58 dB/12 seconds; 59 dB, 17 seconds; 56 dB/15 seconds, 55 dB. Paused out siren. Location ~10 ft above road level on the berm of the apartment level.

Table J: Existing Short-Term Noise Level Measurements (continued)

Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-10	2/11/2016	8:31 a.m.	76.2	3245 Cherry Avenue	Traffic on Cherry Avenue.	Airplane: 5 seconds, 82 L_{eq}. Helicopter: 8 seconds, 74 Leq/5 seconds, 76 Leq. Motorcycle: 2 seconds, 96 L_{eq}.
ST-11	2/11/2016	2:47 p.m.	62.5	3401 Studebaker Road	Traffic on Wardlow Road.	None.
ST-12	5/12/2017	10:32 a.m.	55.3	951 Maine Avenue	Traffic on I-710, aircraft, birds chirping constantly.	Helicopter ~75 dBA max. Distant helicopter. Filtered sirens and dogs. Aircraft, 55 dBA max, train horn in low 50s. Aircraft, 63.2 dBA max. People talking in the distance near playground area.
ST-13	5/17/2017	10:15 a.m.	65.0	3402 Clark Avenue	Traffic on Clark Avenue and Wardlow Road. Some aircraft noise.	51 dBA low traffic noise. 74.3/73.0/66.0 dBA/68.7 dBA/71.4 dBA traffic on Clark Avenue, 75.0 dBA with truck. 65.0 dBA aircraft noise with traffic.
ST-14	5/12/2017	12:10 p.m.	70.0	2002 Pacific Coast Highway	Traffic on Pacific Coast Highway and Cherry Avenue.	Filtered parking lot activity. Loud car 83.0 dBA max, filtered emergency vehicle, car door slam (partial filter), plane flyover (max 75.0 dBA), crosswalk has speaker, beeps.
ST-15	5/12/2017	10:07 a.m.	63.3	Scherer Park	Traffic on East Del Amo Boulevard. Aircraft noise, leaf blower across the street near the YMCA, and some landscaping activities.	53.0 dBA no traffic, with leaf blower. 66.0 dBA traffic on Del Amo, with leaf blower. 60.0 dBA traffic on Del Amo, with leaf blower. 78.0/68.0 dBA aircraft noise.

Table J: Existing Short-Term Noise Level Measurements (continued)

Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-16	5/17/2017	9:29 a.m.	54.9	Pan-American Park, 5157 Centralia Street	Traffic on Centralia Street and Clark Avenue.	Loud car, airplane 71.4 dB, 9:32 a.m. two people begin practicing cricket at 49.1 dBA on the other side of the diamond, airplane 67.7 dBA max with little to no traffic, 61 dBA traffic on Centralia Street, birds chirping, distant aircraft.
ST-17	5/17/2017	9:04 a.m.	56.6	5850 Los Arcos Street	Traffic on Los Arcos Street and Oceana Avenue. Aircraft noise, some landscaping activity.	48.0 dBA no traffic. (Low) ambient noise. 60.0/58.0/57.0/58.0 dBA traffic on Los Arcos Street. 67.0 dBA landscaping noise (part of it filtered out).
ST-18	5/17/2017	9:44 a.m.	56.1	7875 Rosina Street	53.4 dBA low traffic noise. 63.0/62.0 dBA traffic on Rosina Street and Val Verde Avenue.	53.4 dBA low traffic noise. 63.0/62.0 dBA traffic on Rosina Street and Val Verde Avenue.
ST-19	5/12/2017	11:21 a.m.	61.9	Bixby Park, 130 Cherry Avenue	Traffic on Broadway and Cherry Avenue and helicopter flyovers.	Skateboarders near Bixby Park Community Center. Helicopter and loud truck 70.3 dBA max, loud car ~70 dBA, helicopter flyover 72.5 dBA max. Loud motorcycles 71-plus dBA max, 72.5 max. Garbage truck on Cherry Avenue.
ST-20	5/12/2017	12:54 p.m.	67.3	1600 Atlantic Avenue at the northwest corner of Martin Luther King Jr. Avenue and 15th Street	Traffic on Martin Luther King Jr. Avenue and skateboarders at skate park across Martin Luther King Jr. Avenue.	Loud car mid-high 70s dBA. Loud car stereo ~74 dBA, loud cars 76.8 dBA, 84.4 dBA. Filtered shouting. 1:07–1:08 p.m. distant plane (traffic louder), 1:09 p.m. distant plane (skate park louder).

Table J: Existing Short-Term Noise Level Measurements (continued)

Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-21	5/12/2017	11:46 a.m.	57.6	1085 Orizaba Avenue	Traffic noise on Orizaba Avenue and 11th Street, aircraft noise, and noise from school playground.	51.0 dBA playground noise (no traffic). 71.0 dBA traffic on Orizaba Avenue with playground noise. 65.0 dBA aircraft with playground noise. 61 dBA traffic on 11th Street.
ST-22	5/15/2017	11:09 a.m.	71.5	1700 West Willow Street	Traffic on Willow Street and Santa Fe Avenue.	Aircraft mid 60s dBA, 75.8 dBA max, 71.1 dBA max. 11:12 a.m., 11:16 a.m. traffic louder than distant helicopters. Bus stops at nearby stop. Filtered emergency vehicle and siren.
ST-23	5/17/2017	10:33 a.m.	68.2	2201 North Bellflower Boulevard	Traffic on Bellflower Boulevard and Stearns Street.	Loud motorcycle ~77 dBA. Direct airliner flyover 78.9 dBA. Small planes ~71 dBA, traffic and small plane 69.2 dBA. Helicopter ~80 dBA. Plane 73.9 dBA. Traffic louder than tire service center and dryers at carwashes. Traffic and carwash dryers 68.0 dBA. Traffic high 60s low 70s dBA.
ST-24	5/12/2017	11:06 a.m.	56.3	South Greenway and Bixby Village Drive	Traffic on Bixby Village Drive, some traffic on South Greenway, faint aircraft noise.	42.5 dBA no traffic. 62.0/59.0 dBA no traffic on Greenway. 72.0 dBA traffic, bus. 57.0 dBA traffic on Bixby Village Drive. 68.0 dBA helicopter.

Table J: Existing Short-Term Noise Level Measurements (continued)

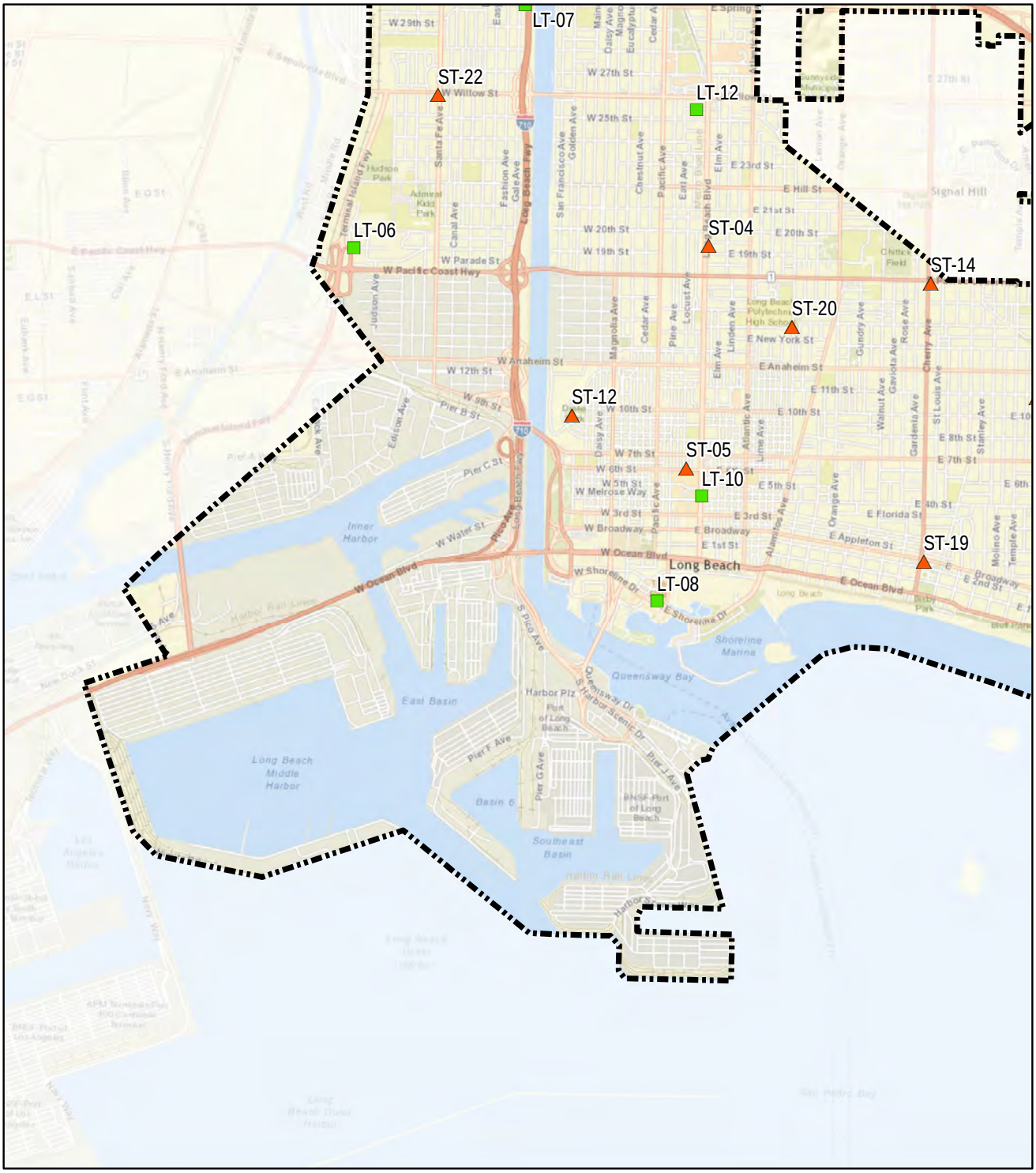
Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-25	5/19/2017	1:38 p.m.	67.0	1802 North Studebaker Road	Traffic on Studebaker Road, Atherton Street, and I-405.	Motorcycle on Studebaker Road ~77.9 dBA. Heavy truck on southbound Studebaker Road ~79 dBA. Loud pickup truck on northbound Studebaker Road 77.0 dBA. Traffic on Studebaker Road reaches low 70s dBA intermittently.
ST-26	5/12/2017	10:32 a.m.	58.5	22 60th Street	Traffic on Ocean Boulevard. Some noise from street sweeper.	42.0 dBA no traffic. 57.0 dBA traffic on Ocean Boulevard. 70.0 dBA traffic on Ocean Boulevard.
ST-27	5/15/2017	12:27 p.m.	63.2	1147 East South Street	Traffic on Orange Avenue and South Street.	Filtered emergency vehicle. 12:40 p.m. distant car alarm.
ST-28	5/15/2017	11:51 a.m.	72.2	6020 Long Beach Boulevard	Traffic on Long Beach Boulevard and Victoria Street. Some trucks pulling into stop.	11:54 a.m. plane (heavy truck louder). Filtered medium truck passby directly behind meter. High truck percentage.
ST-29	5/15/2017	10:33 a.m.	60.0	4974 Oregon Avenue	Traffic on Del Amo Boulevard and some traffic on Oregon Avenue.	54.0 dBA low traffic on Del Amo Boulevard. 63.6 dBA, 65/0 dBA traffic on Del Amo Boulevard. 71.0 dBA traffic on Del Amo Boulevard and aircraft noise.

Table J: Existing Short-Term Noise Level Measurements (continued)

Monitor No.	Date	Start Time	dBA L_{eq}	Location Description	Noise Sources	Notes
ST-30	5/19/2017	12:51 p.m.	51.2	2339 Curry Street	HVAC at 2380 Curry Street and possible generator, distant aircraft, and traffic, some activity at industrial uses at 2380 Curry Street and 2339 Curry Street, and a wind pump.	Occasional windpump wheel noise (50.0–51.9 dBA). Aircraft ~50 dBA, aircraft and wheel 54.5/~53 dBA. ~1:00 p.m. cars maneuvering west of 2339 Curry Street, high 50s, low 60s dBA. Car passby mid 60s dBA, pickup truck passby 61.9 dBA, minivan 61.3 dBA. Filtered dogs and distant emergency vehicles.
ST-31	5/17/2017	8:46 a.m.	57.8	Hartwell Park, 5801 Parkcrest Street	Traffic on Carson Street and Woodruff Avenue.	Two low-flying airplanes and traffic 64.2 dBA. Car without muffler low 70s dBA Propeller plane and light traffic 70.9 dBA. Birds chirping. Allen Tire Co. across street, traffic is louder. Filtered sirens.
ST-32	5/12/2017	12:26 p.m.	65.2	Clark Avenue and Atherton Street	Traffic on Clark Avenue and Atherton Street.	None.

Source: LSA (2017).
L_{eq} = average noise level
CNEL = Community Noise Equivalent Level
dB = decibel(s)
dBA = A-weighted decibel(s)
ft = feet
HVAC = heating, ventilation, and air conditioning
I-405 = Interstate 405
I-710 = Interstate 710
SR-1 = State Route 1
SR-91 = State Route 91
SR-103 = State Route 103

Figure 2: Area 1, Noise Monitoring Locations



LSA

LEGEND

Long Beach City Boundary

Monitoring Location Type

Long

Short

0 2000 4000
FEET

SOURCE: Esri (2016); LSA (5/2017)

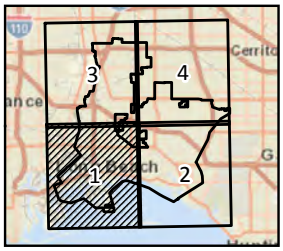
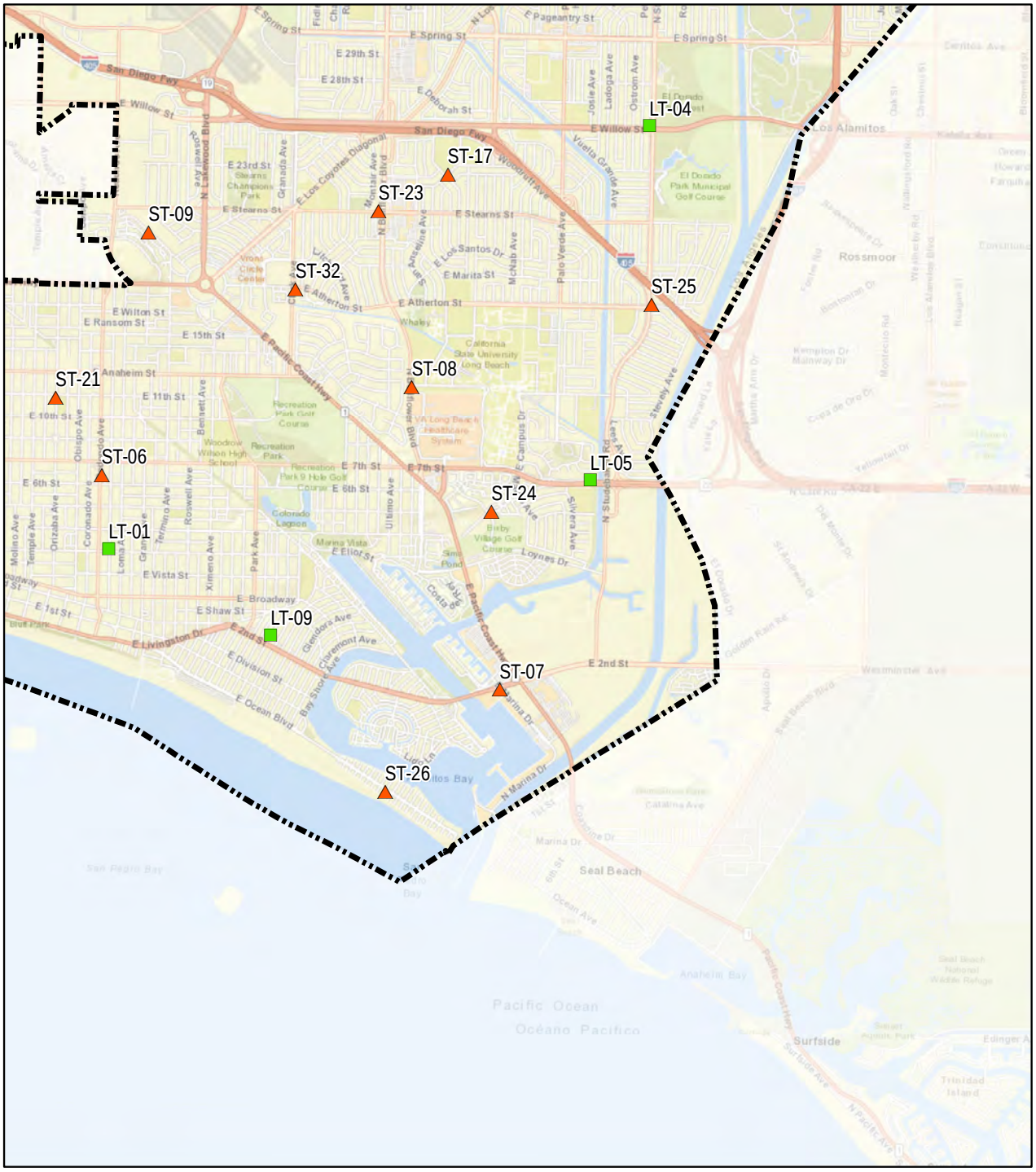


FIGURE 2
Page 1 of 4

City of Long Beach Noise Element Update
Noise Monitoring Locations

Figure 2: Area 2, Noise Monitoring Locations



LSA

LEGEND

Long Beach City Boundary

Monitoring Location Type

Long

Short

0 2000 4000
FEET

SOURCE: Esri (2016); LSA (5/2017)

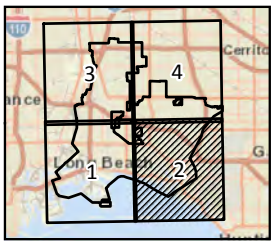
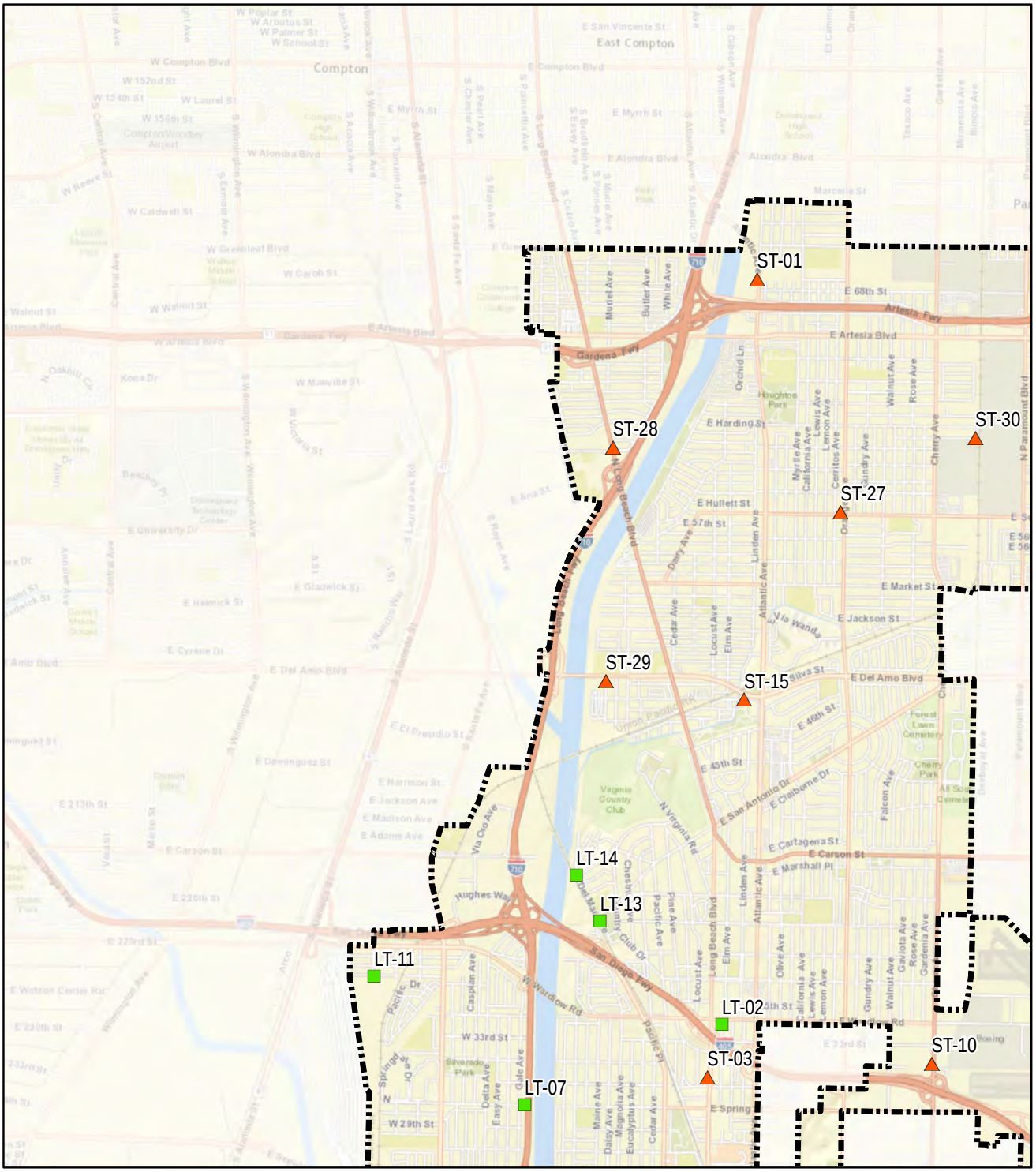


FIGURE 2
Page 2 of 4

City of Long Beach Noise Element Update
Noise Monitoring Locations

Figure 2: Area 3, Noise Monitoring Locations



LSA

LEGEND

Long Beach City Boundary

Monitoring Location Type

Long

Short

0 2000 4000
FEET

SOURCE: Esri (2016); LSA (5/2017)

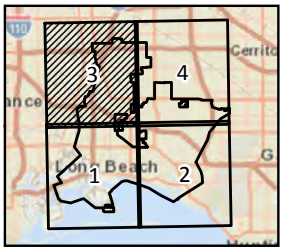
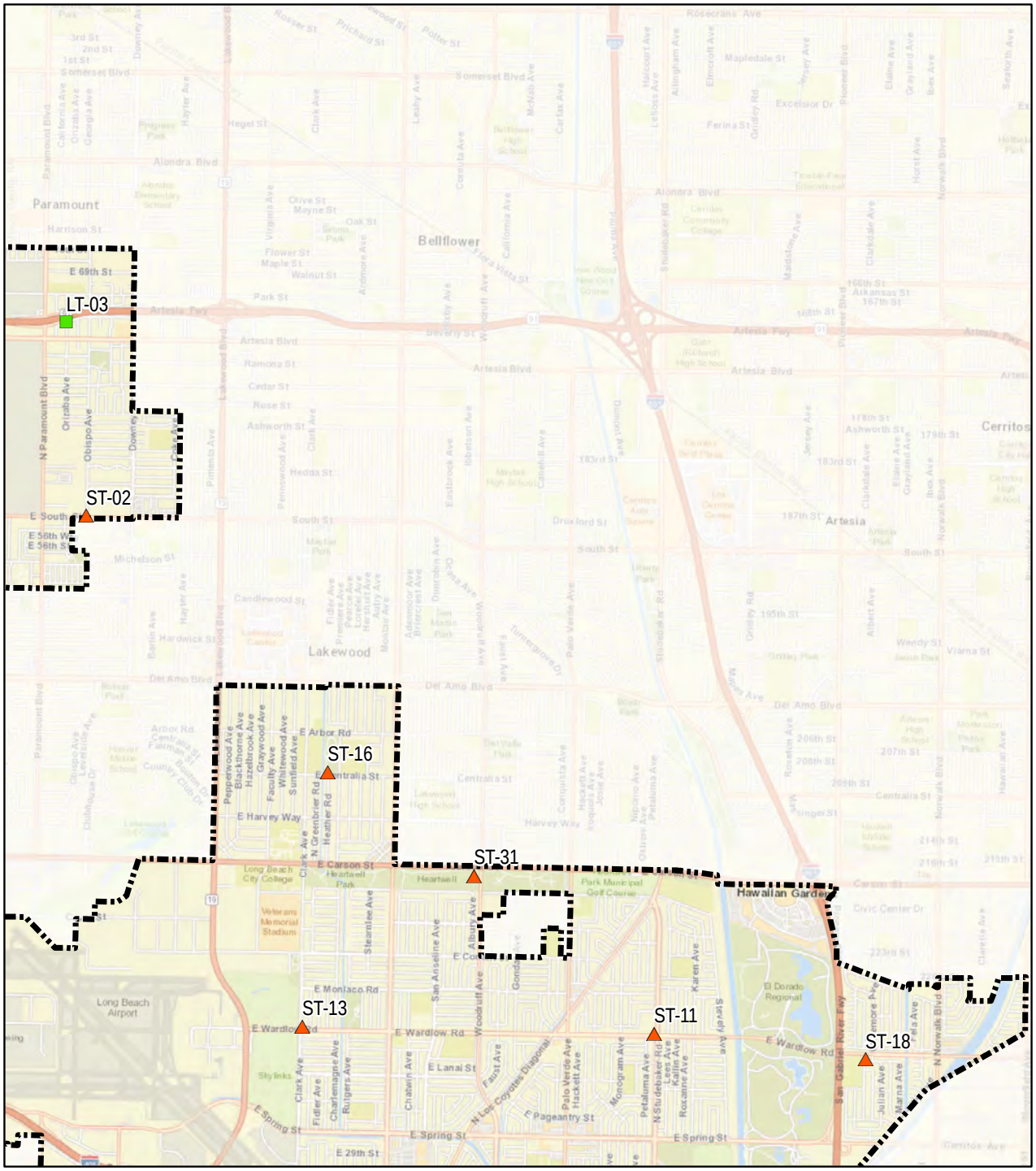


FIGURE 2
Page 3 of 4

City of Long Beach Noise Element Update
Noise Monitoring Locations

Figure 2: Area 4, Noise Monitoring Locations



LSA

LEGEND

Long Beach City Boundary

Monitoring Location Type

Long

Short

0 2000 4000
FEET

SOURCE: Esri (2016); LSA (5/2017)

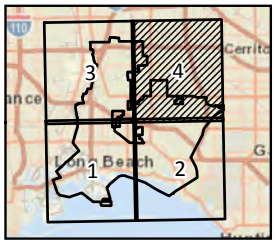
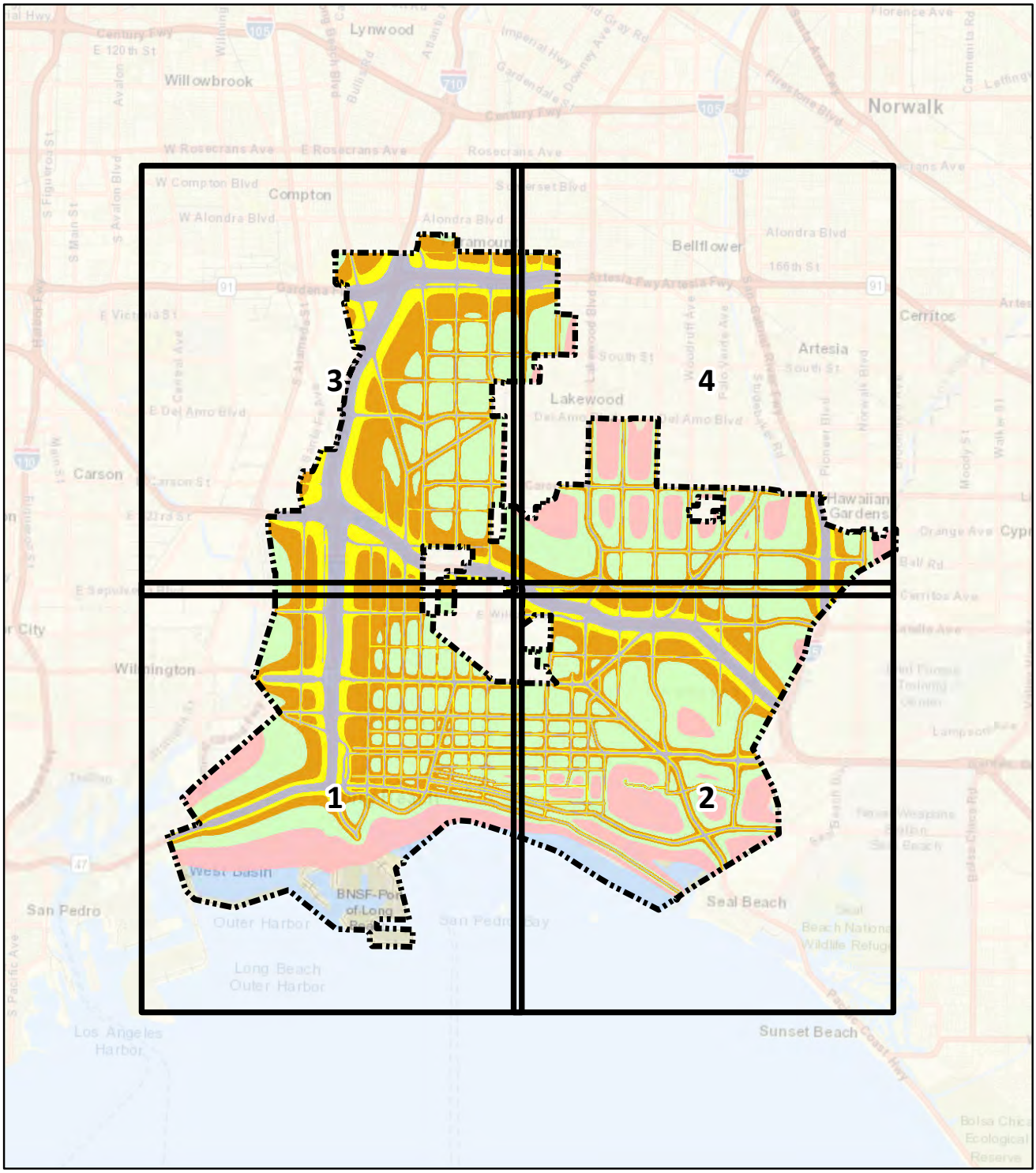


FIGURE 2
Page 4 of 4

City of Long Beach Noise Element Update
Noise Monitoring Locations

Figure 3: Existing Traffic Noise Contours Area Overview



LSA

LEGEND

Long Beach City Boundary

Contour Value

55 dBA Ldn

60 dBA Ldn

65 dBA Ldn

70 dBA Ldn

75 dBA Ldn

0 1 2
MILES

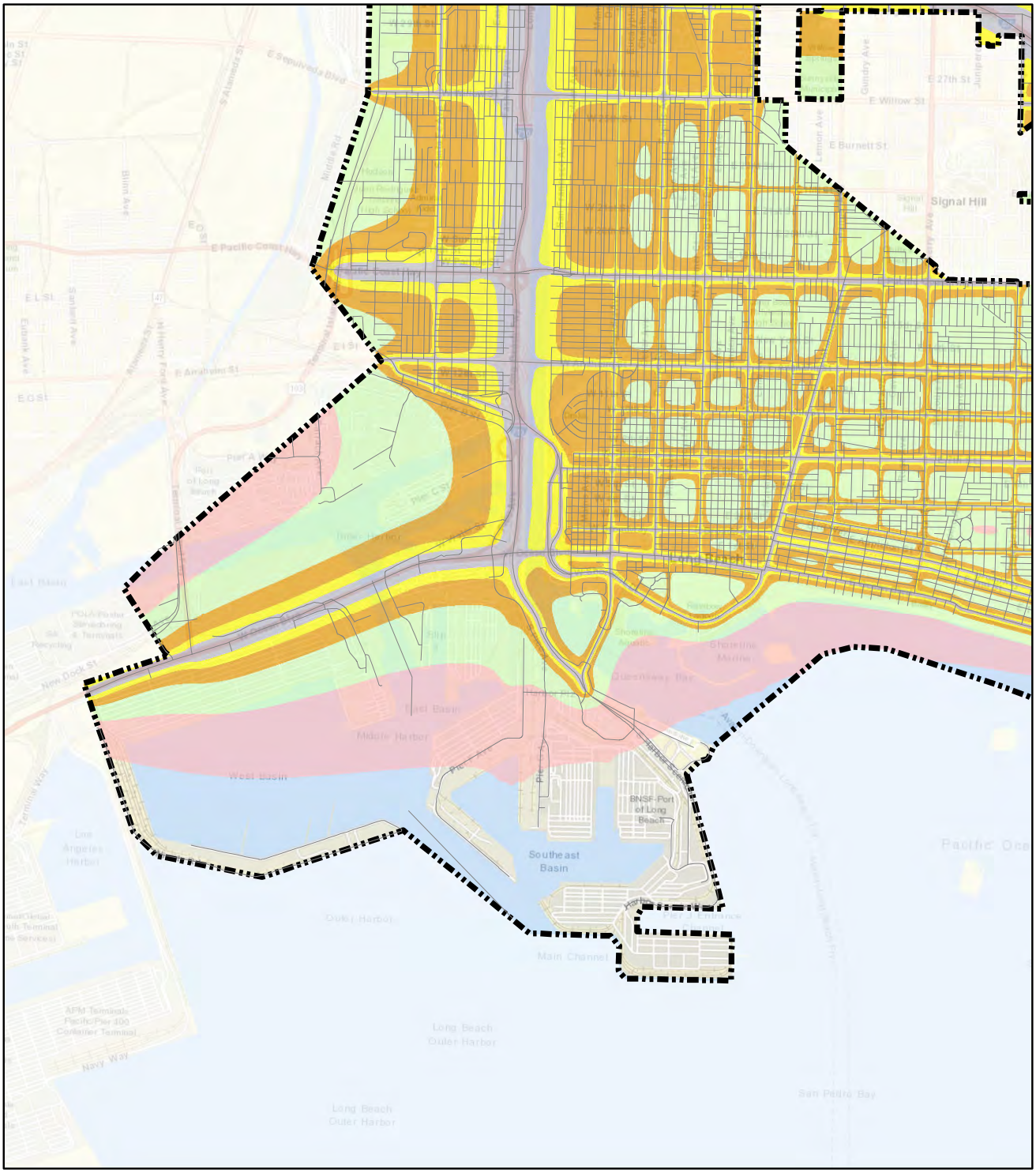
SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Overview

City of Long Beach Noise Element Update

Existing Traffic Noise Contours

Figure 3: Area 1, Existing Traffic Noise Contours



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

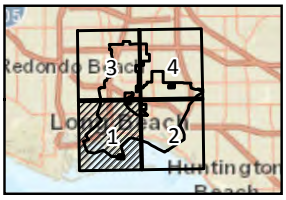
55 dBA Ldn

60 dBA Ldn

65 dBA Ldn

70 dBA Ldn

75 dBA Ldn



N

0 2000 4000
FEET

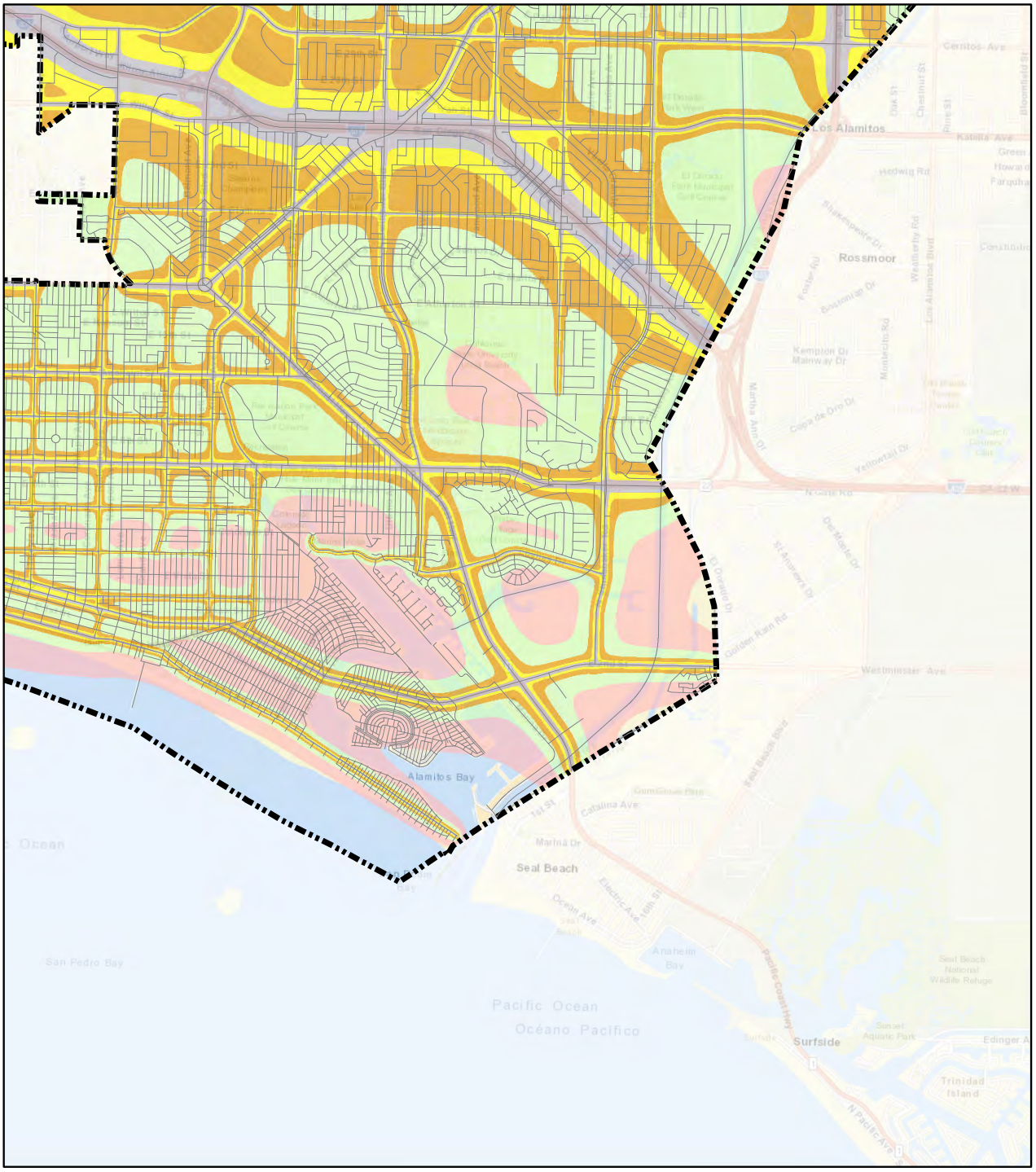
SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Page 1 of 4

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours

Figure 3: Area 2, Existing Traffic Noise Contours



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

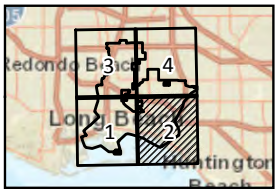
55 dBA Ldn

60 dBA Ldn

65 dBA Ldn

70 dBA Ldn

75 dBA Ldn



0 2000 4000
FEET

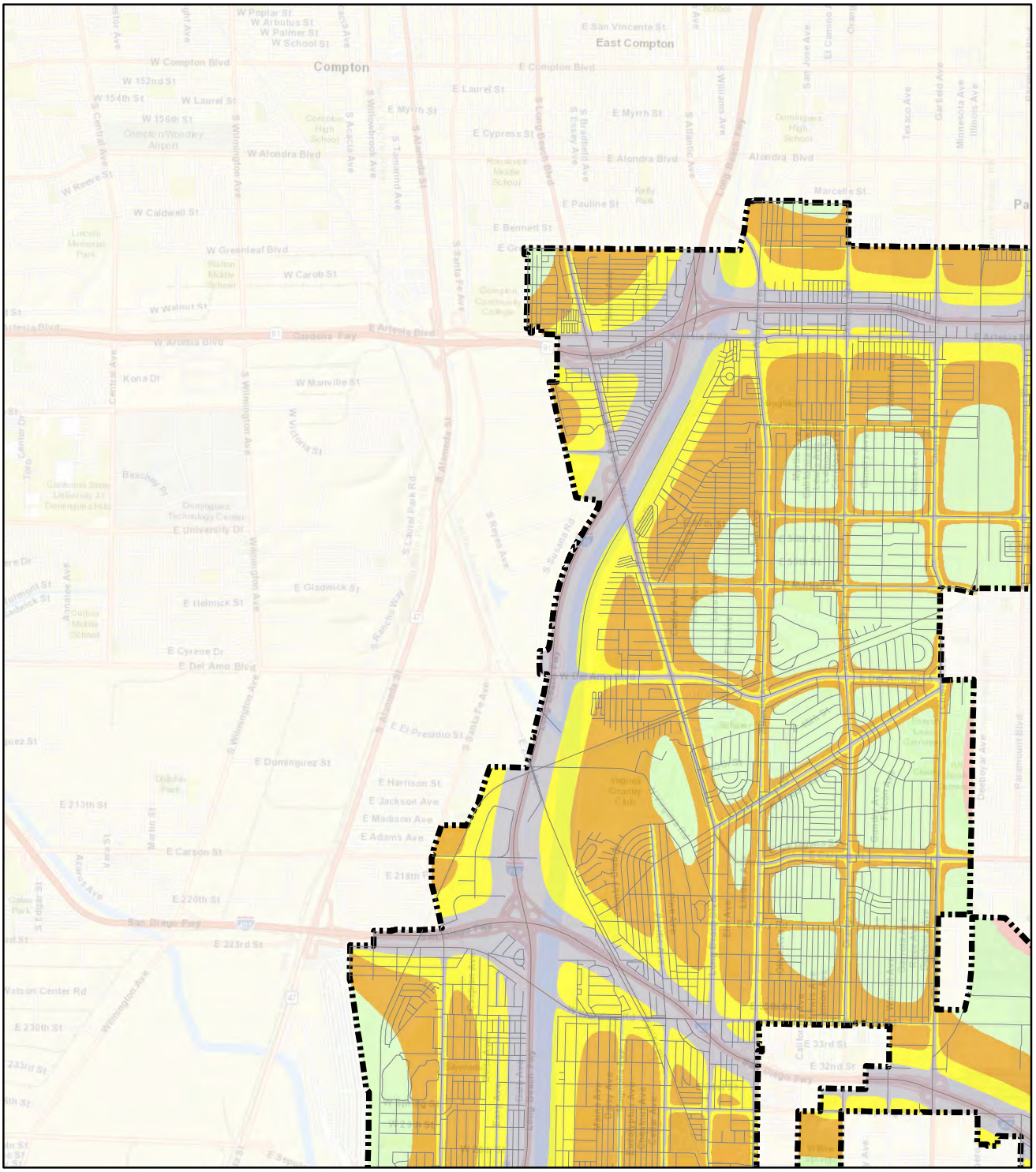
SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Page 2 of 4

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours

Figure 3: Area 3, Existing Traffic Noise Contours



LSA

LEGEND

- Long Beach City Boundary
- City of Long Beach Centerlines

Contour Value

- 55 dBA Ldn
- 60 dBA Ldn
- 65 dBA Ldn
- 70 dBA Ldn
- 75 dBA Ldn

0 2000 4000
FEET

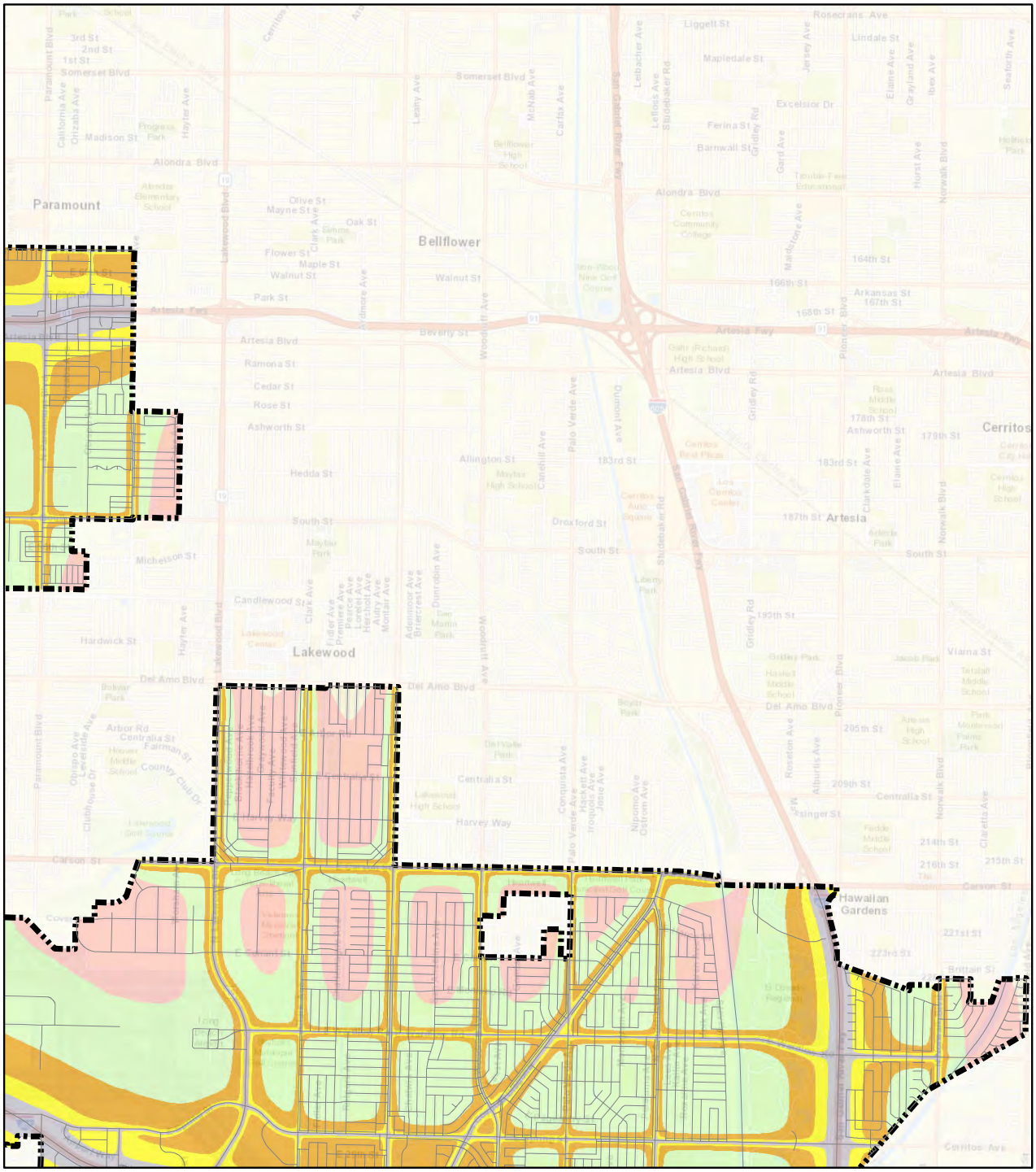
SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Page 3 of 4

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours

Figure 3: Area 4, Existing Traffic Noise Contours



LSA

LEGEND

- Long Beach City Boundary
- City of Long Beach Centerlines

Contour Value

- 55 dBA Ldn
- 60 dBA Ldn
- 65 dBA Ldn
- 70 dBA Ldn
- 75 dBA Ldn

0 2000 4000
FEET

SOURCE: Esri (2016); LSA (5/2017)

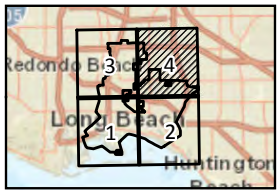
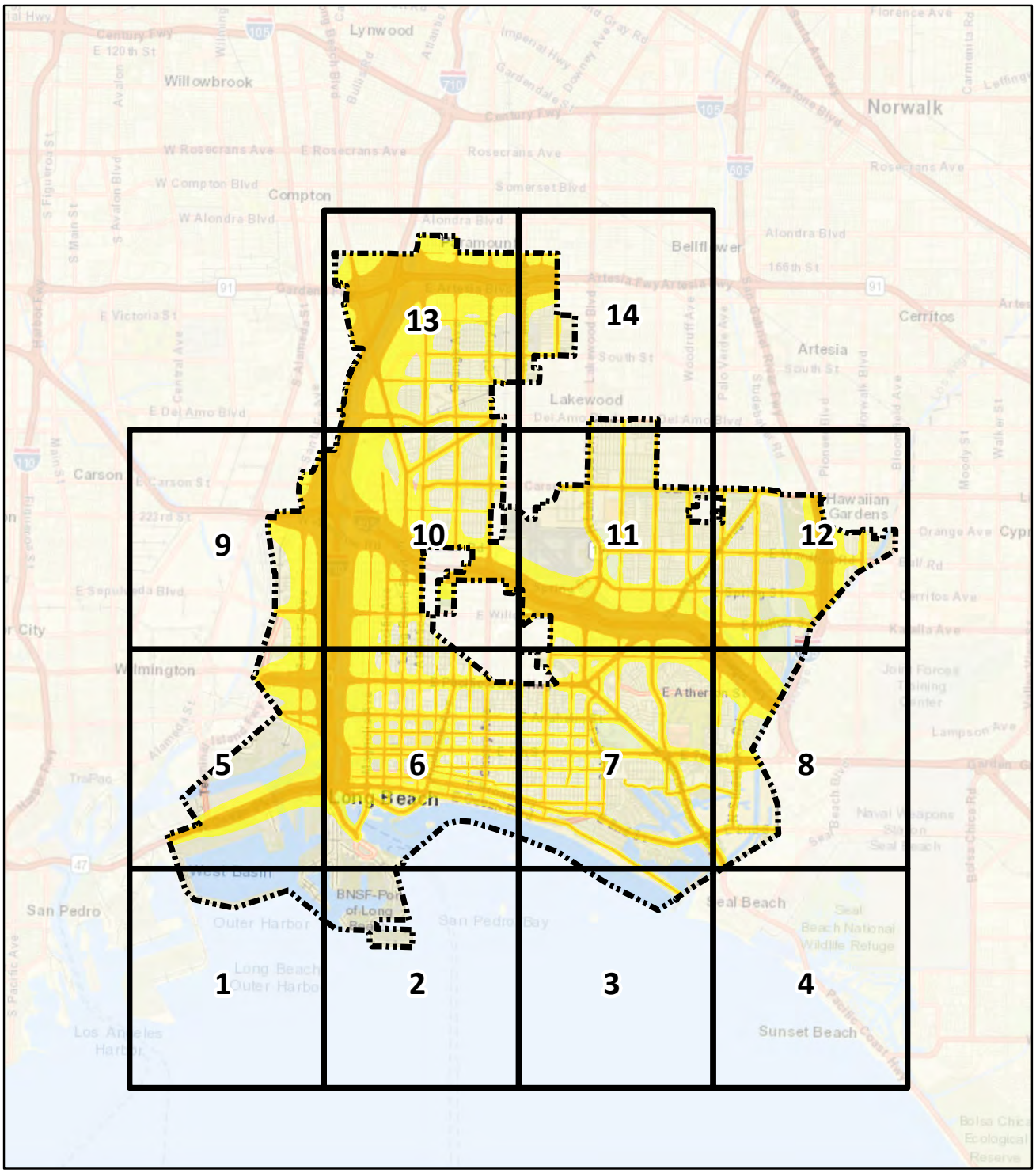


FIGURE 3
Page 4 of 4

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours

Figure 3: Existing Traffic Noise Contours (65 and 70 dba) Area Overview



LSA

LEGEND

Long Beach City Boundary

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1 2
MILES

SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Overview

City of Long Beach Noise Element Update

Existing Traffic Noise Contours

Figure 3: Area 1, Existing Traffic Noise Contours (65 and 70 dba)

LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

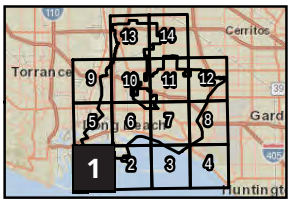
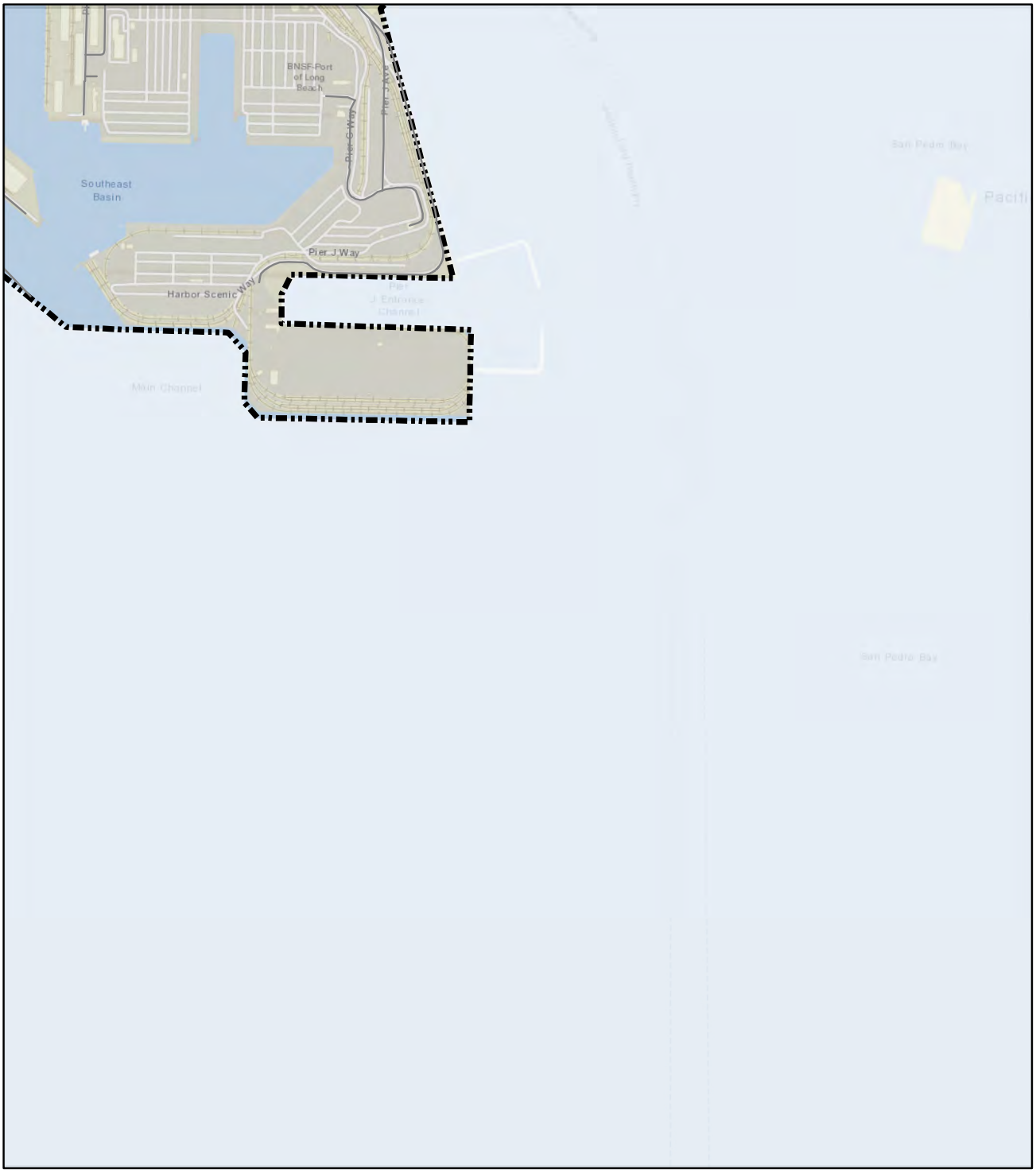


FIGURE 3
Page 1 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 2, Existing Traffic Noise Contours (65 and 70 dba)



LSA

N

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

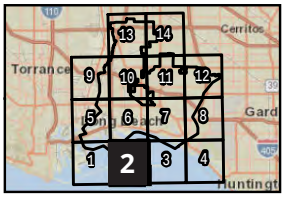
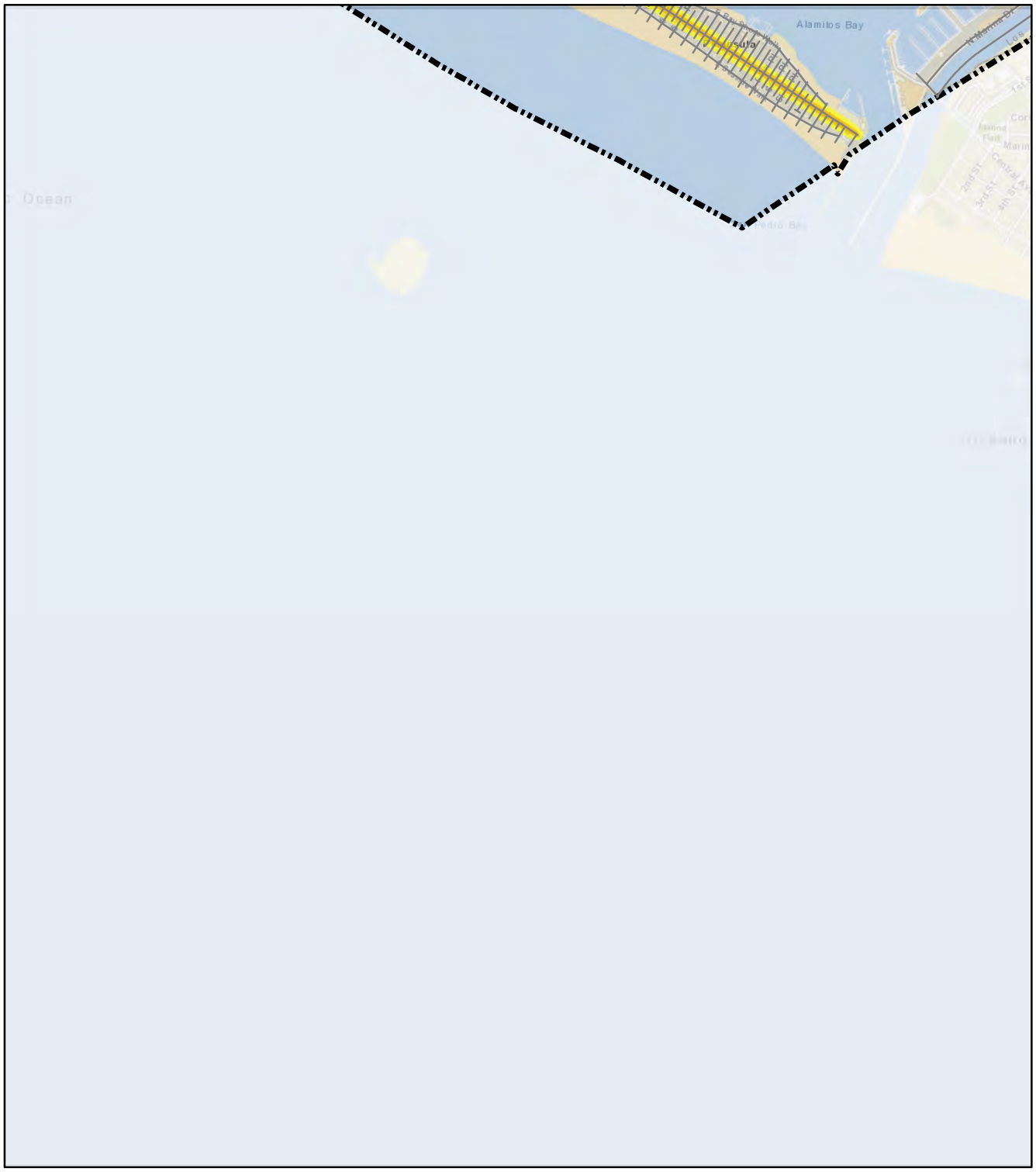


FIGURE 3
Page 2 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 3, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

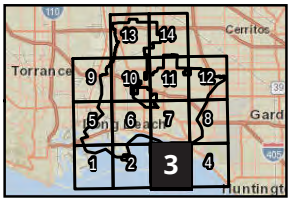
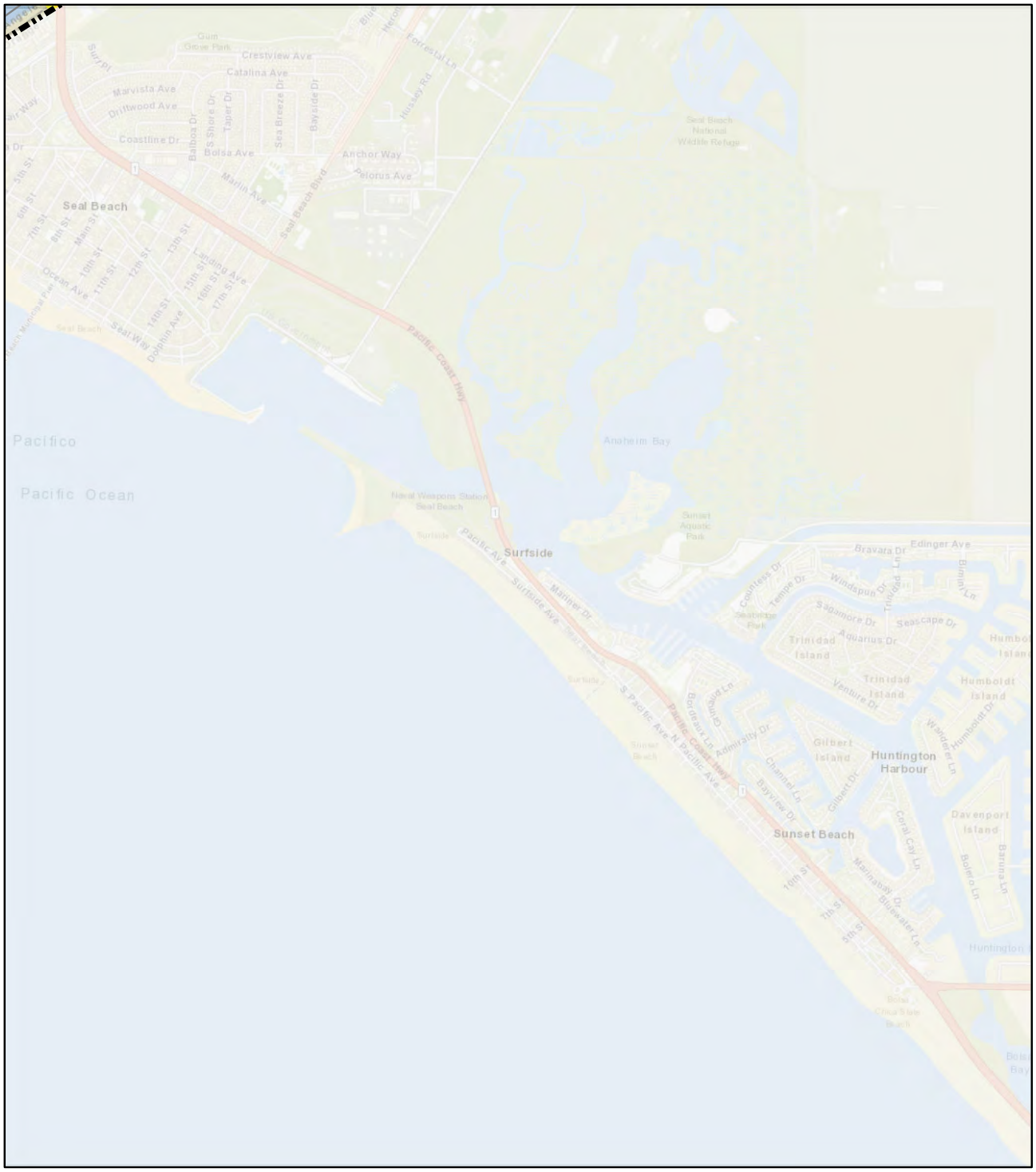


FIGURE 3
Page 3 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 4, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

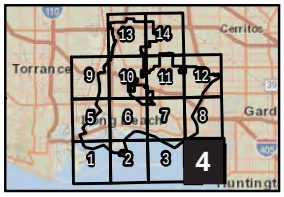


FIGURE 3
Page 4 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 5, Existing Traffic Noise Contours (65 and 70 dba)

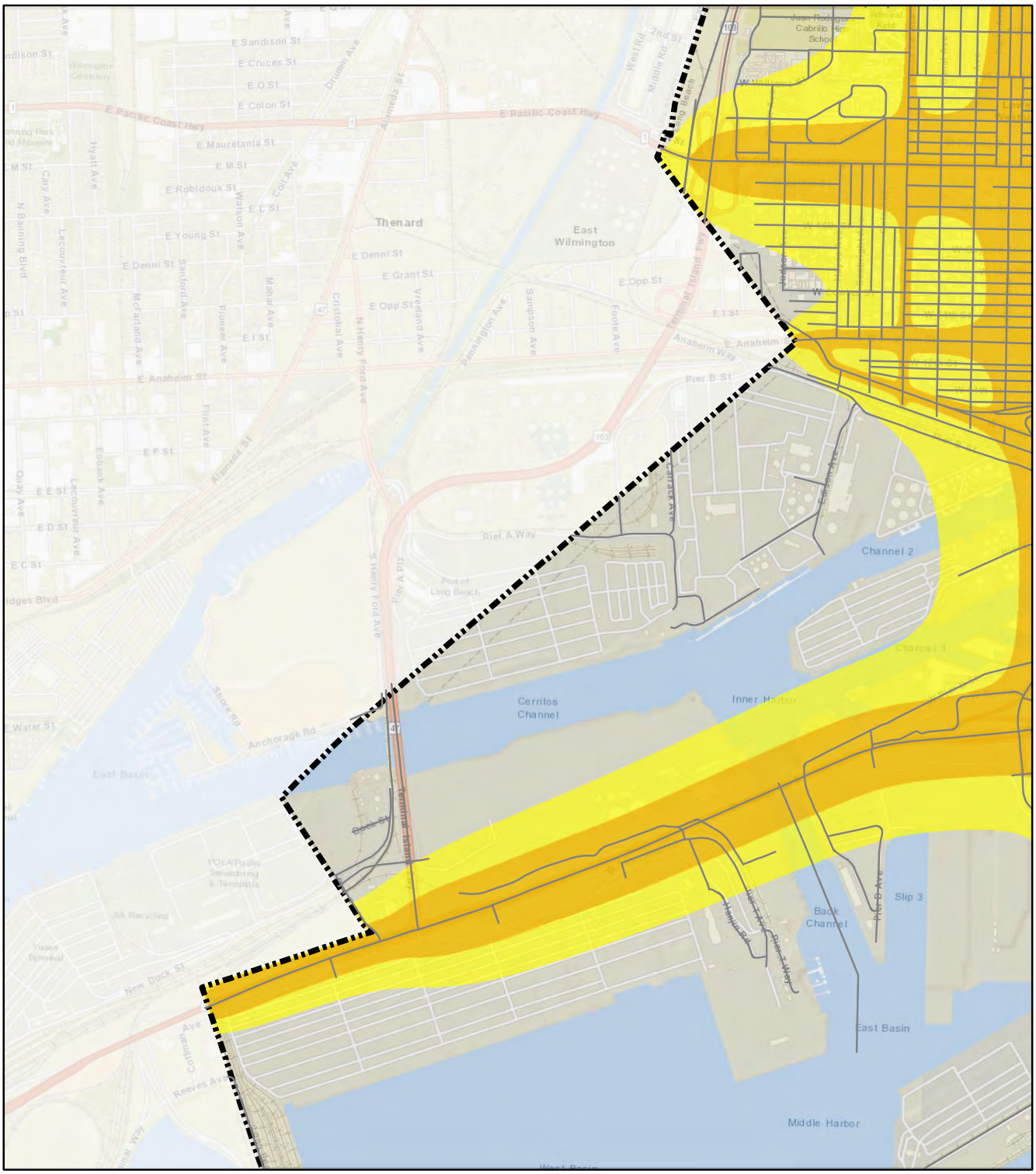
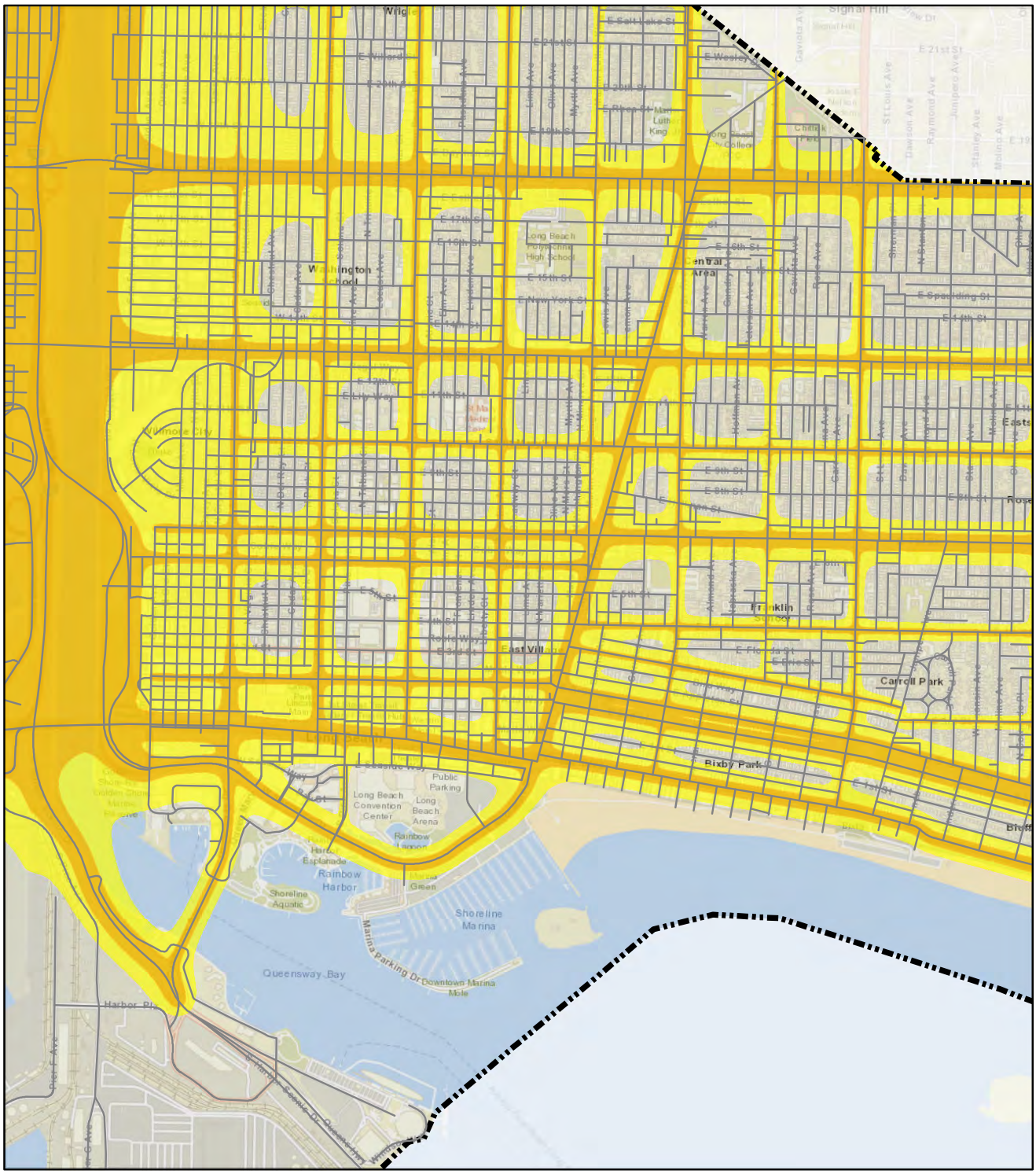

Thenard
East Wilmington
Cerritos Channel
Inner Harbor
Channel 2
Channel 3
Back Channel
Slip 3
East Basin
Middle Harbor
Pier A Way
Anaheim Way
Pier B St
E Pacific Coast Hwy
E Anaheim St
Alameda St
N Henry Ford Ave
S Henry Ford Ave
Terminal Island Fwy
Anchorage Rd
Shore Rd
Pier A Plz
Port of Long Beach
Cabrillo High School
Juan Rodriguez Cabrillo Park
Harbor Park
Hotel Queen Mary
Pier T Way
Harbor Bar
Pier G Ave
Edison Ave
Fishermans Wharf
Cottonwood Ave
Reeves Ave
New Dock St
Dock St
East Basin
West Basin
POLA/Pacific Seaworking & Terminals
SA Recycling
Yusen Terminal
Wilmington Cemetery
Drumm Ave
Colorado St
Hyatt Ave
Cary Ave
N Banning Blvd
Lecouvreur Ave
Eubank Ave
Quay Ave
Flint Ave
Pioneer Ave
Mahar Ave
Watson Ave
Sanford Ave
McFarland Ave
Cristobal Ave
Vrieland Ave
Pennington Ave
Sampson Ave
Foote Ave
Middle Rd
West Rd
2nd St
E Sandison St
E Cruces St
E D St
E Colon St
E Mauretania St
E M St
E Robidoux St
E L St
E Young St
E Denni St
E Grant St
E Opp St
E I St
E Anaheim St
E F St
E E St
E D St
E C St
E Water St
Bridges Blvd
Ave
Ave
Ave

Figure 3: Area 6, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

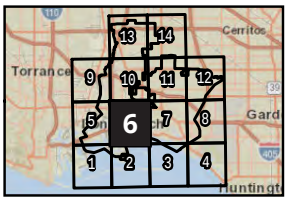
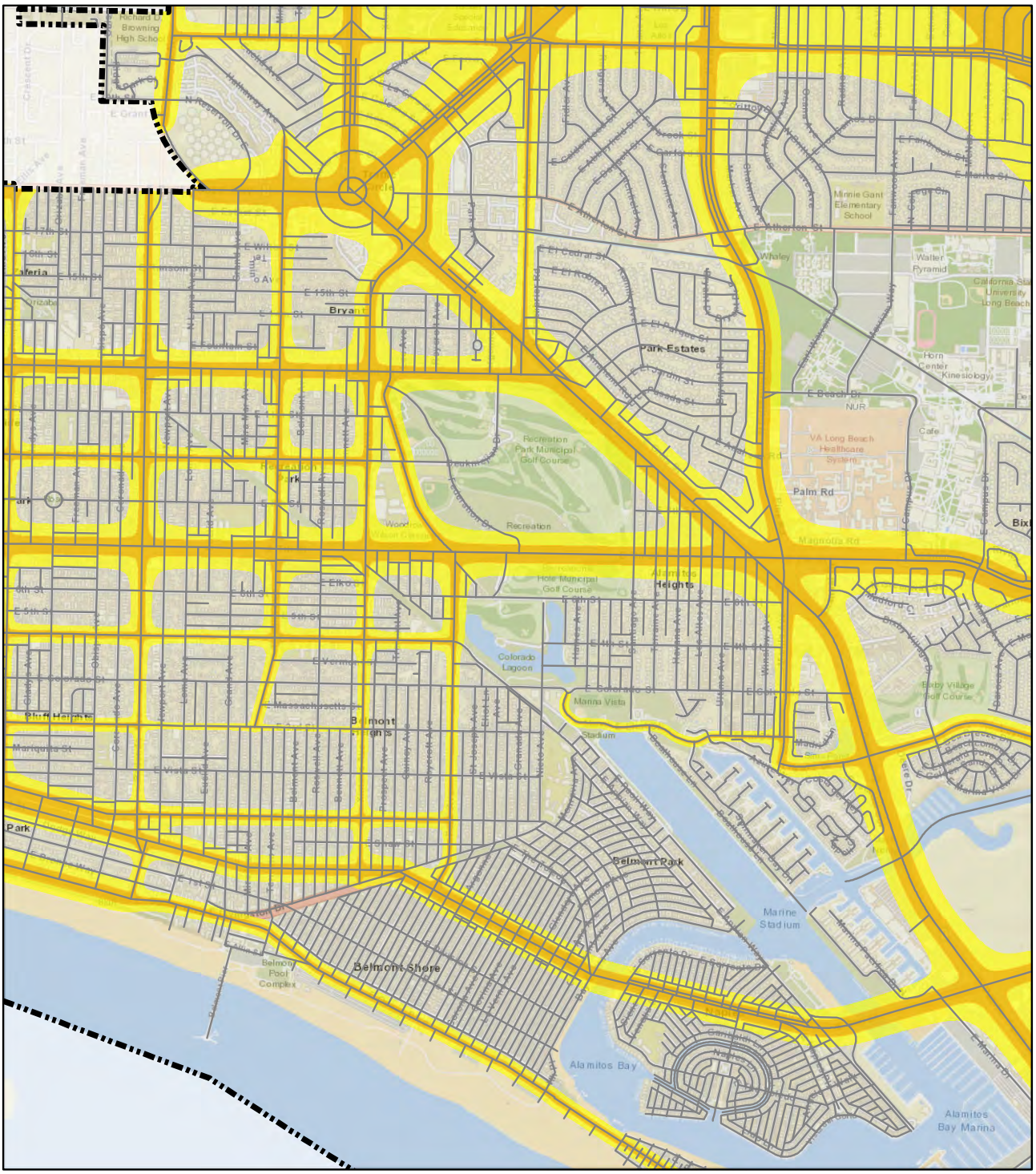


FIGURE 3
Page 6 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 7, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

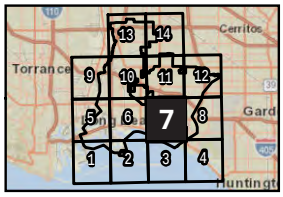
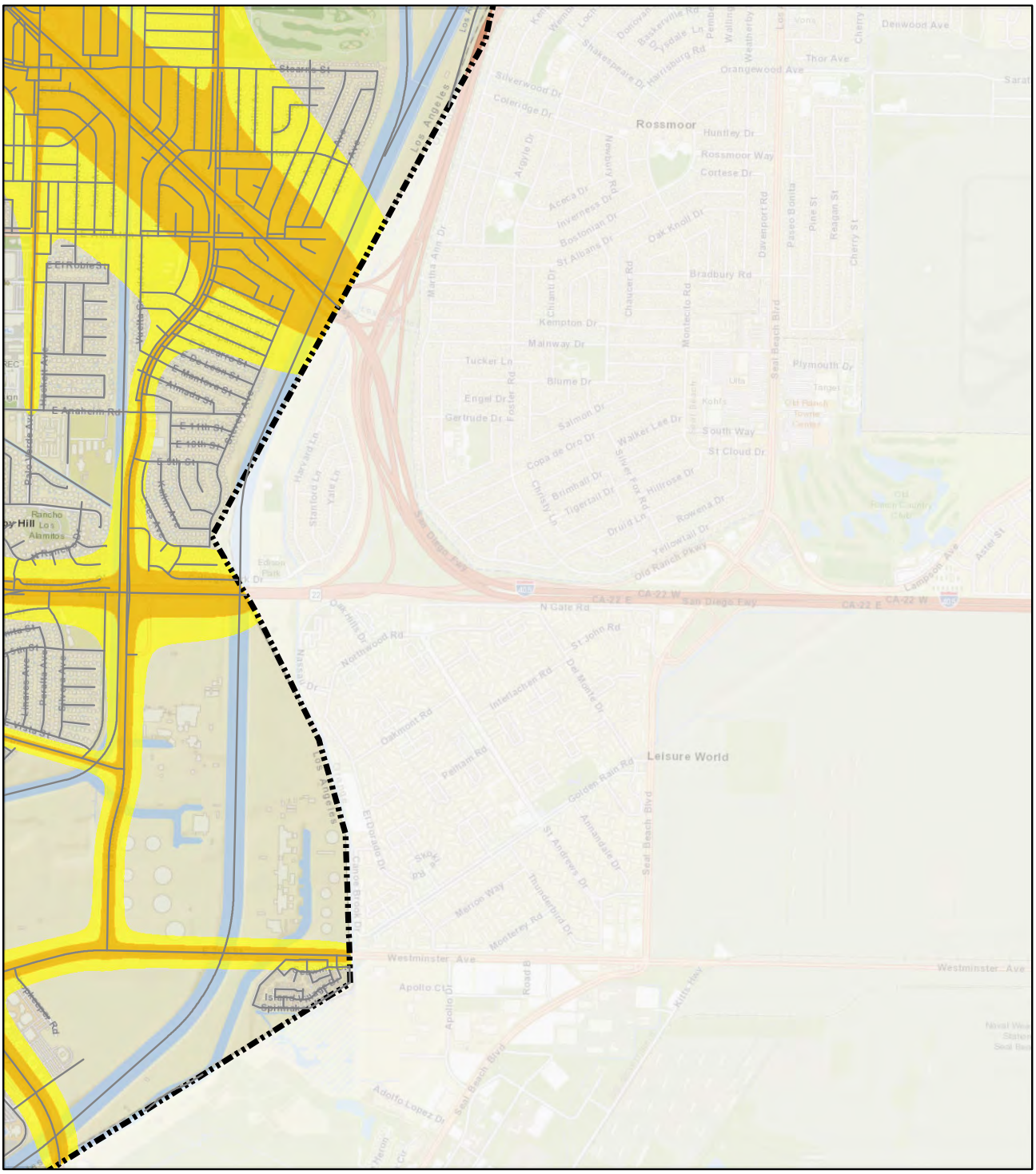


FIGURE 3
Page 7 of 14

City of Long Beach Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 8, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000 FEET

SOURCE: Esri (2016); LSA (5/2017)

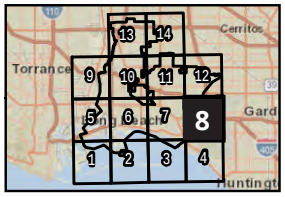
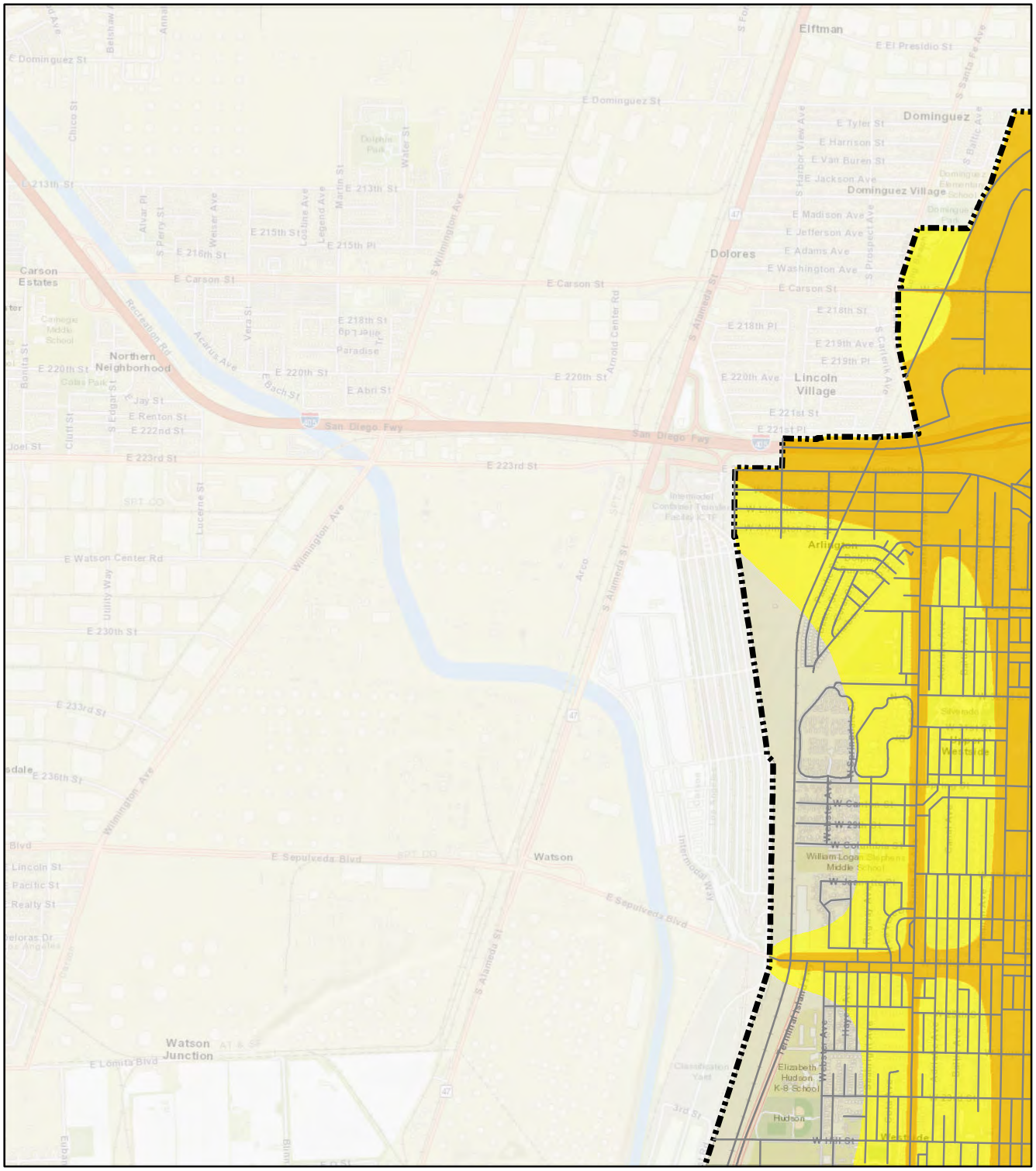


FIGURE 3
Page 8 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 9, Existing Traffic Noise Contours (65 and 70 dba)



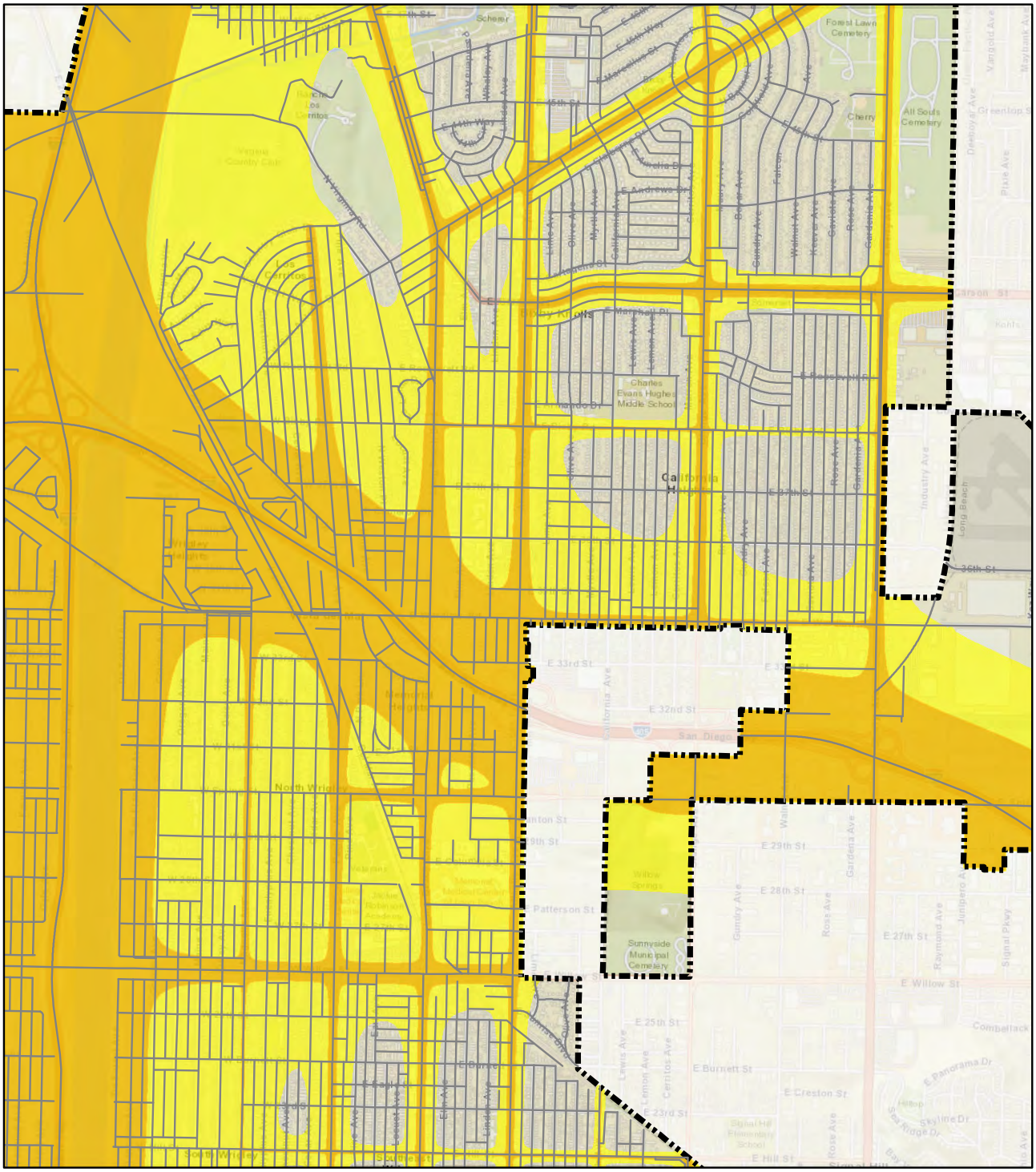
SOURCE: Esri (2016); LSA (5/2017)

FIGURE 3
Page 9 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 10, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

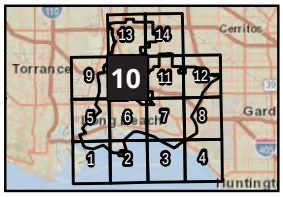
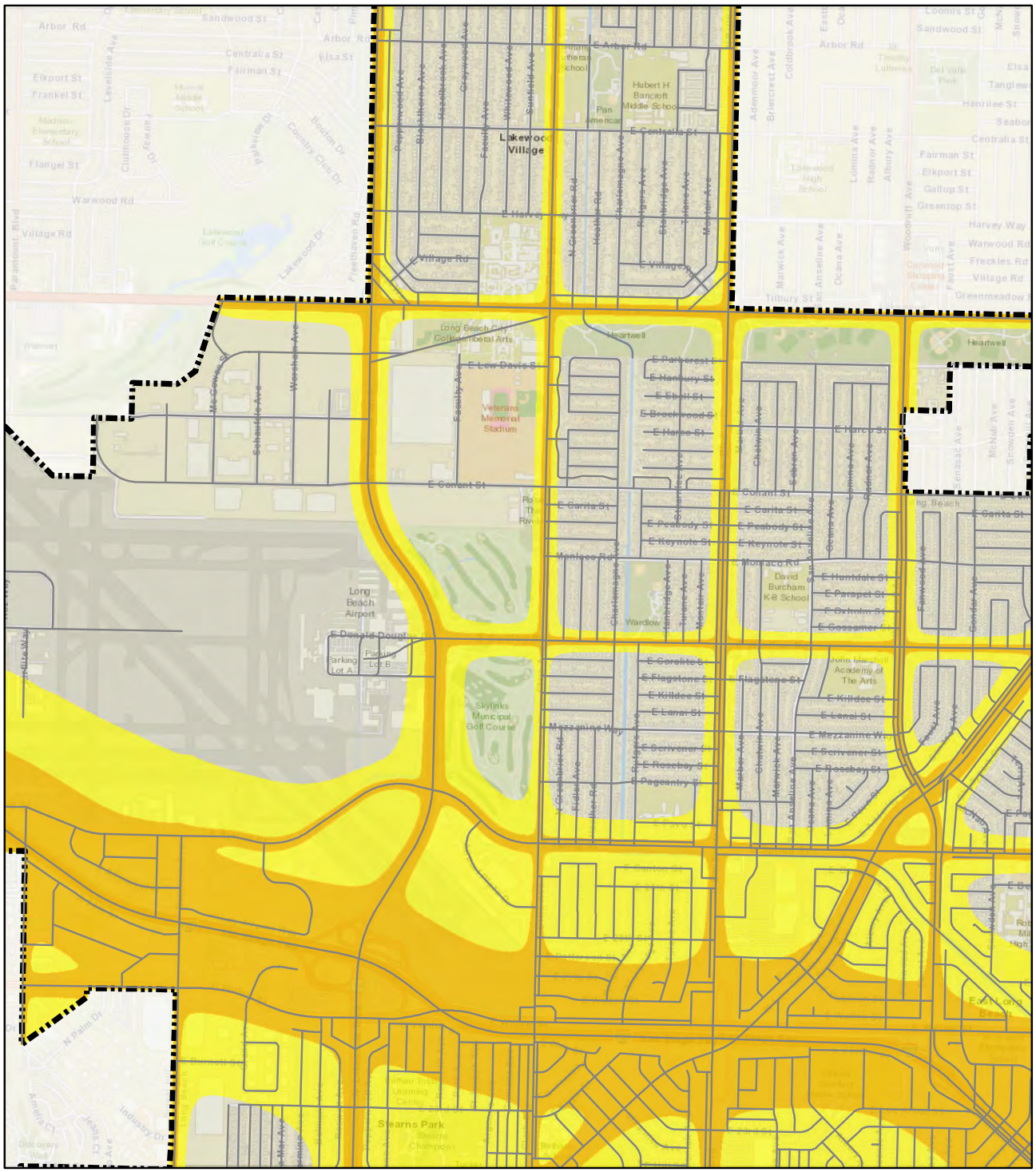


FIGURE 3
Page 10 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 11, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

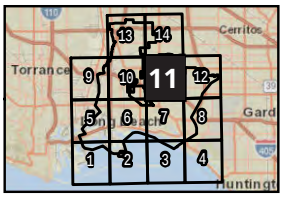
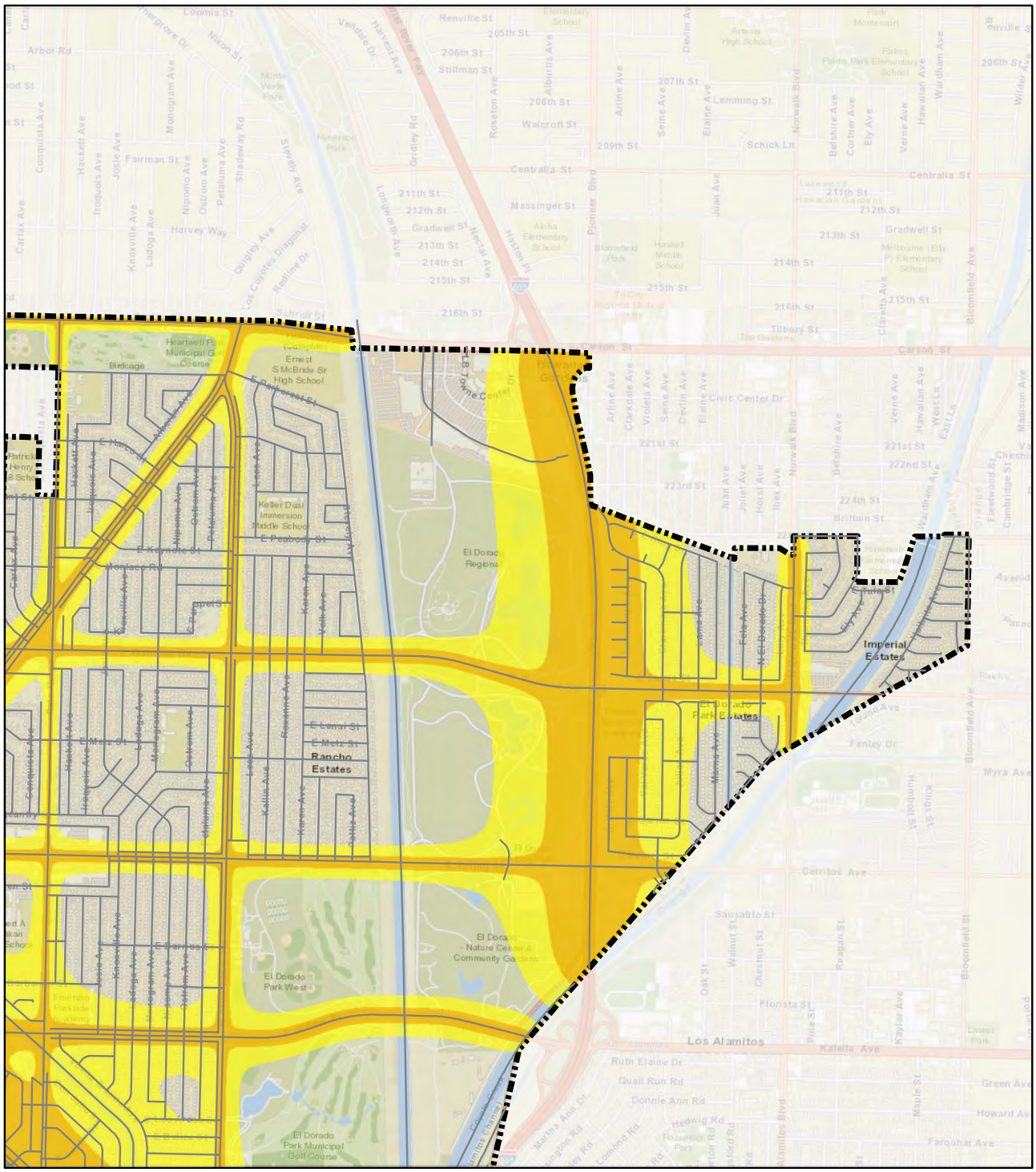


FIGURE 3
Page 11 of 14

City of Long Beach Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 12, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

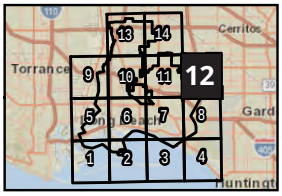
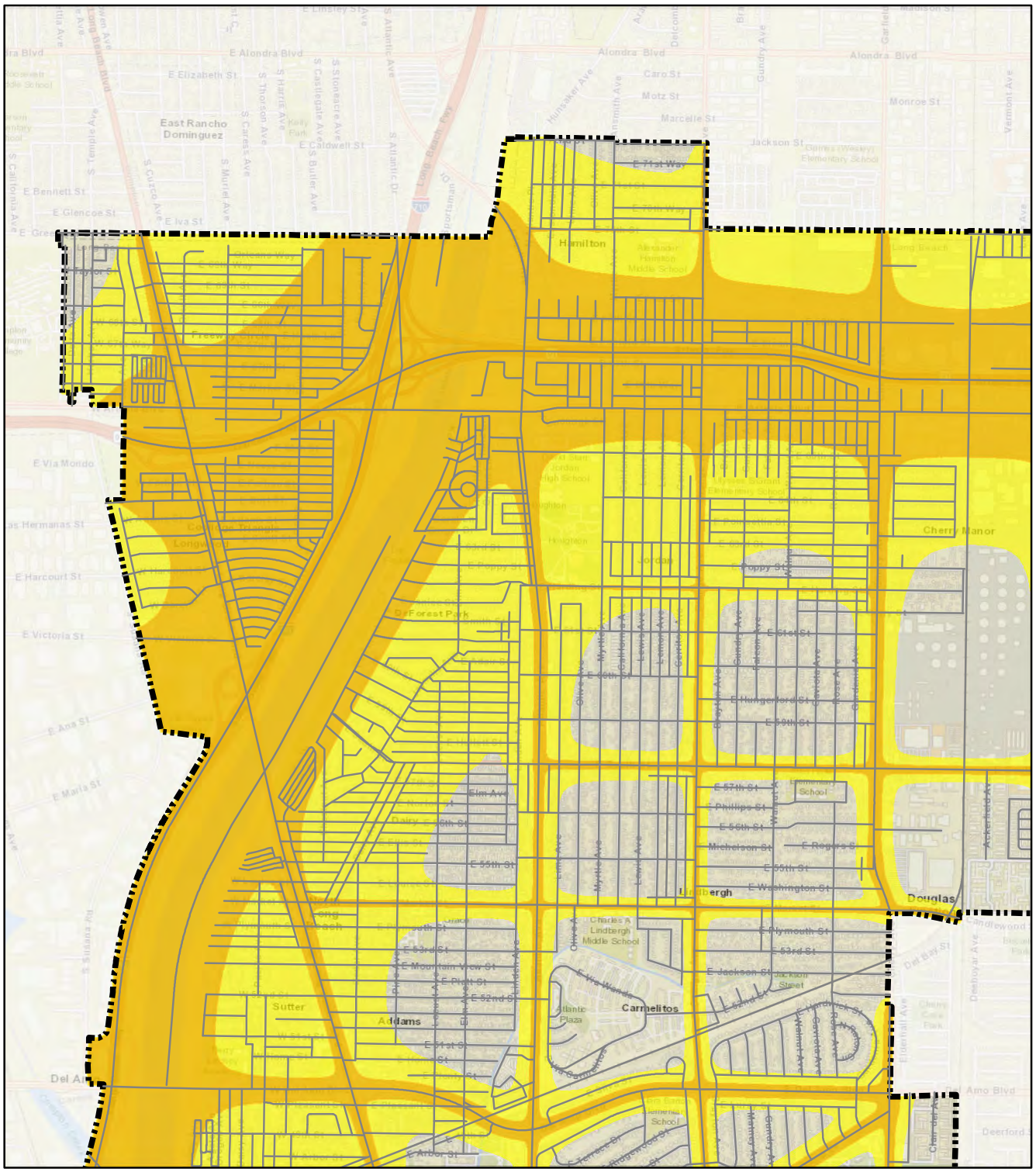


FIGURE 3
Page 12 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 13, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

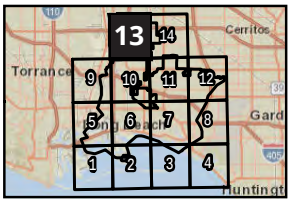
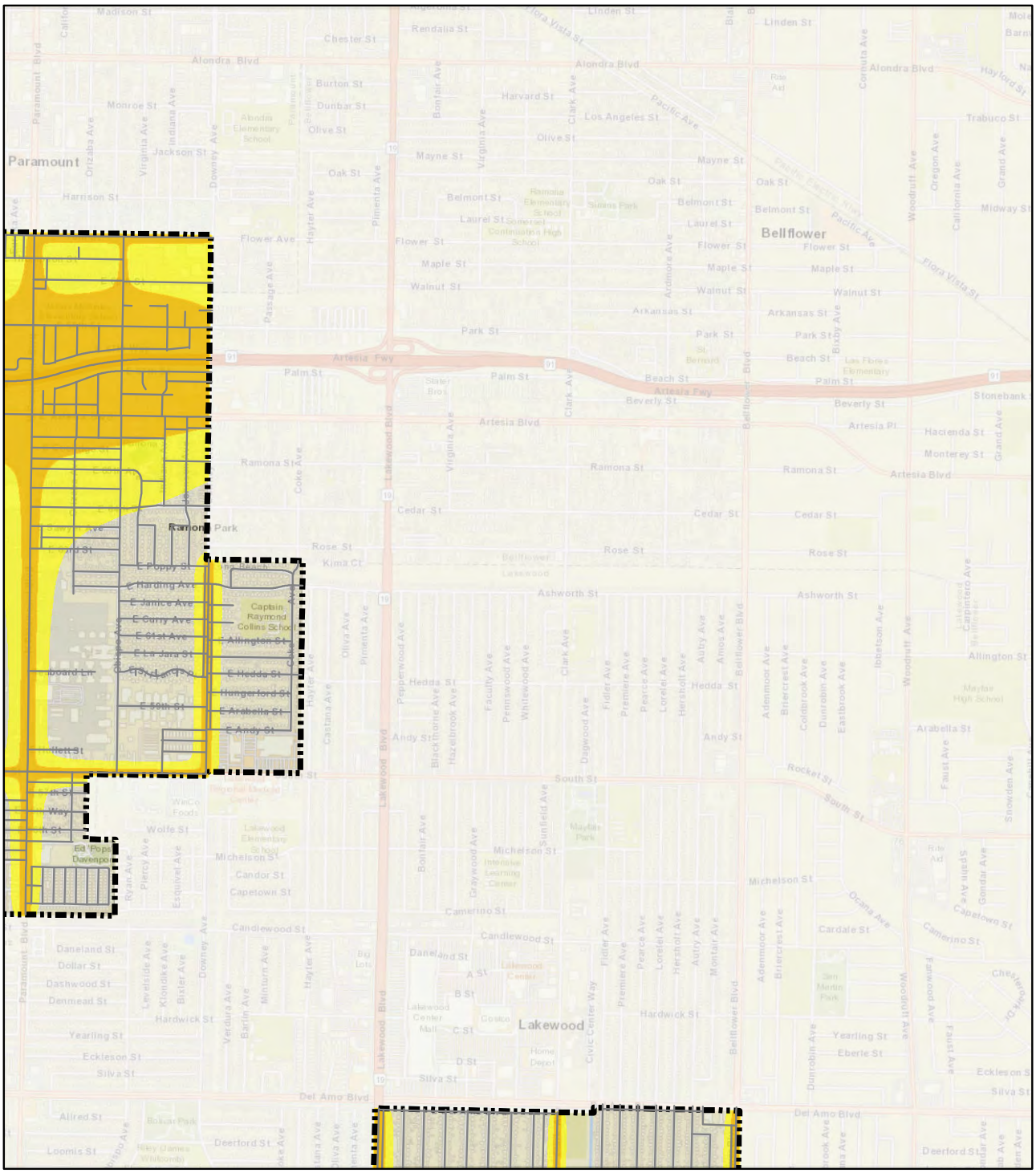


FIGURE 3
Page 13 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

Figure 3: Area 14, Existing Traffic Noise Contours (65 and 70 dba)



LSA

LEGEND

Long Beach City Boundary

City of Long Beach Centerlines

Contour Value

65 dBA Ldn

70 dBA Ldn

0 1000 2000
FEET

SOURCE: Esri (2016); LSA (5/2017)

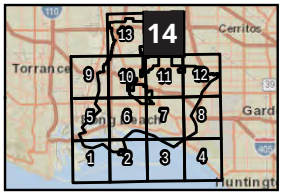


FIGURE 3
Page 14 of 14

City of Long Beach
Noise Element Update

Existing Traffic Noise Contours - 65 and 70 dBA Ldn

3.3 Existing Airport Noise Contours

As stated above, aircraft noise within the City is predominately influenced by operations at the Long Beach Airport. Currently, the Long Beach Noise Airport Noise Office monitors the noise impacts created by aircraft operations at 18 permanent locations. The state-of-the-art noise monitoring system along with the noise budget is utilized to keep aircraft below the State mandated 65 dBA CNEL. Noise sensitive receptors that are located within the 65 dBA CNEL contours (Figure 4, Existing Long Beach Airport Noise Contour) have the potential to experience noise level impacts that may disturb sleep without the implementation of proper noise mitigation.

Other regional airports that have the potential for operations to affect citizens of the City include Compton/Woodley Airport (CPM), Los Alamitos Army Airfield (AAF), John Wayne-Santa Ana International Airport (SNA), and Los Angeles International Airport (LAX). All sensitive uses within the City are outside the 65 dBA CNEL contour of each airport.

3.4 Existing Noise and Land Use Compatibility Discussion

As presented in Figure 3, there are portions of the City in which noise sensitive uses fall within a traffic noise contour that may present undesirable noise environments. In addition to elevated traffic noise levels, the City, due to its large population and the numerous commercial or industrial uses, it is understood that noise levels are of concern to residents. The current Draft Land Use Element provides a vision for future development in the City of Long Beach and establishes revised plan areas and neighborhoods. Utilizing the information presented in the Draft Land Use Element, in order to minimize noise conflicts to the greatest extent feasible, the City intends to establish a thorough set of goals, plans and policies in its General Plan Noise Element to limit noise and land use compatibility conflicts where possible. With the recognition of the various neighborhoods, specifically the uses that are contained with each area, more applicable and unique criteria can be established such that the citizens and business operators can work together with the City to create an environment that is livable and enjoyable.

Figure 4: Existing Long Beach Airport Noise Contours

LSA

LEGEND

- 65 dBA CNEL
- 70 dBA CNEL
- City of Long Beach Boundary

0 750 1500
FEET

SOURCE: Bing (11/2014); Noise Contours - City of Long Beach (4th Quarter, 2016)

FIGURE 4

City of Long Beach Noise Element Update

Existing Long Beach Airport Noise Contours

3.5 References

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Appendix A - Traffic Data

Appendix A - Traffic Data

Appendix A provides a summary of the traffic data utilized to create the existing noise contours presented in this report. The General Plan Mobility Element establishes a context-sensitive street classification plan for all streets within the City of Long Beach. For reference, definitions of the street classification system are listed below:

Regional Corridor
Designed for intraregional and intercommunity mobility, these corridors emphasize traffic movement and include signalized pedestrian crossings. The adjacent land uses should provide continuous mixed-use and commercial land uses with adequate off-street parking to minimize dependency on on-street parking.

Boulevard
Characterized by a long-distance, medium-speed corridor that traverses an urbanized area, boulevards consist of four or fewer vehicle travel lanes, a balanced multimodal function, landscaped medians, on-street parking, narrower travel lanes, more intensive land use oriented to the street, and wide sidewalks. Buildings uniformly line the edges.
Multiway boulevards, a variation of the boulevard characteristic of post war neighborhoods, contain a central roadway for through traffic and parallel roadways for access to abutting property parking, and pedestrian and bicycle facilities. Parallel roadways are separated from the through-lane by curbed, landscaped islands that may also provide transit stops and pedestrian facilities.

Major Avenue
A major avenue serves as the major route for the movement of traffic within the City as well as a connector to neighboring cities. Most traffic using a major avenue will end the trip within the City (as opposed to through-traffic). As such, design treatment and traffic operation should give preference to this type of traffic. Long corridors with typically four or more lanes, avenues may be high transit ridership corridors. Goods movement is typically limited to local routes and deliveries.

Minor Avenue
A minor avenue provides for the movement of traffic to neighborhood activity centers and serves as a route between neighborhoods. Avenues serve as a primary bicycle route and may serve local transit routes as well.

Neighborhood Connector
A neighborhood connector street serves trips generated in surrounding or adjacent neighborhoods, and should discourage through-trips that do not end within the neighborhood. Goods movement is restricted to local deliveries only.

Local Street
Local streets primarily provide access to individual residential parcels. The streets are generally two lanes with on-street parking, tree planting strips, and sidewalks. Traffic on a local street should have a trip end on that street, or on a connecting local street, or to a connector.

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Appendix A - Traffic Data

Classification	Roadway Segment	Between		Existing ADT*
Boulevard	Terminal Island Freeway	Willow Street	Pacific Coast Highway	16,900
Major Avenue	Santa Fe Avenue	Dominguez Street	Carson Street	20,800
		Carson Street	Wardlow Road	19,900
		Wardlow Road	Willow Street	24,100
		Willow Street	Pacific Coast Highway	12,000
		Pacific Coast Highway	Anaheim Street	11,600
		Anaheim Street	9th Street	8,000
Neighborhood Connector	Easy Avenue	Wardlow Road	Willow Street	7,700
		Willow Street	Pacific Coast Highway	4,900
Neighborhood Connector	Magnolia Avenue	Wardlow Road	Spring Street	7,500
		Spring Street	Willow Street	8,500
		Willow Street	Hill Street	3,100
		Hill Street	Pacific Coast Highway	2,800
Minor Avenue	Magnolia Avenue	Pacific Coast Highway	Anaheim Street	5,200
		Anaheim Street	10th Street	10,100
		10th Street	7th Street	9,300
		7th Street	6th Street	10,100
		6th Street	3rd Street	7,600
Major Avenue	Magnolia Avenue	3rd Street	Broadway	15,000
		Broadway	Ocean Boulevard	24,700
		Ocean Boulevard	Shoreline Drive	28,500
Boulevard	Magnolia Avenue	Shoreline Drive	Harbor Scenic	21,900
Minor Avenue	Pacific Avenue	North of	Wardlow Road	19,500
		Wardlow Road	Spring Street	24,700
		Spring Street	Willow Street	18,100
		Willow Street	Hill Street	12,200
		Hill Street	Pacific Coast Highway	10,000
Major Avenue	Pacific Avenue	Pacific Coast Highway	Anaheim Street	4,300
		Anaheim Street	10th Street	9,800
		10th Street	7th Street	8,400
		7th Street	6th Street	12,600
		6th Street	3rd Street	15,000
		3rd Street	Broadway	15,100
		Broadway	Ocean Boulevard	14,800
Minor Avenue	Pine Avenue	Ocean Boulevard	Shoreline Drive	900
Boulevard	Long Beach Boulevard	Greenleaf Boulevard	Artesia Boulevard	26,400
		Artesia Boulevard	Victoria Street	28,000
		Victoria Street	Market Street	36,400

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Market Street	Del Amo Boulevard	25,100
		Del Amo Boulevard	San Antonio Drive	24,100
		San Antonio Drive	Bixby Road	25,300
		Bixby Road	Wardlow Road	36,100
		Wardlow Road	Spring Street	30,800
		Spring Street	Willow Street	12,600
		Willow Street	Hill Street	12,100
		Hill Street	Pacific Coast Highway	8,700
		Pacific Coast Highway	Anaheim Street	8,400
		Anaheim Street	10th Street	11,500
		10th Street	7th Street	6,800
		7th Street	6th Street	14,200
		6th Street	3rd Street	7,800
		3rd Street	Broadway	9,800
		Broadway	Ocean Boulevard	6,100
Major Aveue	Atlantic Avenue	70th Street	Artesia Boulevard	33,100
		Artesia Boulevard	Harding Street	18,900
		Harding Street	South Street	22,500
		South Street	Market Street	14,600
		Market Street	Del Amo Boulevard	14,800
		Del Amo Boulevard	San Antonio Drive	12,500
		San Antonio Drive	Carson Street	11,300
		Carson Street	Bixby Road	26,600
		Bixby Road	Wardlow Road	23,600
		Wardlow Road	Spring Street	30,800
		Spring Street	Willow Street	12,600
		Willow Street	Hill Street	12,100
		Hill Street	Pacific Coast Highway	8,700
		Pacific Coast Highway	Anaheim Street	8,400
		Anaheim Street	10th Street	11,500
		10th Street	7th Street	6,800
		7th Street	6th Street	14,200
		6th Street	3rd Street	7,800
		3rd Street	Boardway	9,800
		Boardway	Ocean Boulevard	6,100
Neighborhood Connector	Martin Luther King Jr Avenue	Willow Street	Hill Street	3,300
		Hill Street	Pacific Coast Highway	3,800
		Pacific Coast Highway	Anaheim Street	5,700
		Anaheim Street	10th Street	7,100
		10th Street	7th Street	2,400
		7th Street	6th Street	700

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
Boulevard	Alamitos Avenue	Pacific Coast Highway	Anaheim Street	13,700
		Anaheim Street	10th Street	24,200
		10th Street	7th Street	24,500
		7th Street	6th Street	31,000
		6th Street	4th Street	36,500
		4th Street	3rd Street	29,200
		3rd Street	Broadway	26,900
		Broadway	Ocean Boulevard	28,900
Minor Avenue	Orange Avenue	North of	70th Street	7,400
		70th Street	Artesia Boulevard	8,200
		Artesia Boulevard	Harding Street	8,800
		Harding Street	South Street	12,200
		South Street	Market Street	9,900
		Market Street	Del Amo Boulevard	10,500
		Del Amo Boulevard	San Antonio Drive	11,600
		San Antonio Drive	Carson Street	17,200
		Carson Street	Bixby Road	16,600
		Bixby Road	Wardlow Road	20,100
		Wardlow Road	Spring Street	12,500
Major Avenue	Orange Avenue	Hill Street	Pacific Coast Highway	17,200
Neighborhood Connector	Orange Avenue	Pacific Coast Highway	Alamitos Avenue	30,000
		Alamitos Avenue	Anaheim Street	2,500
		Anaheim Street	10th Street	6,200
		10th Street	7th Street	7,400
		7th Street	4th Street	3,300
		4th Street	3rd Street	5,400
		3rd Street	Broadway	4,600
		Broadway	Ocean Boulevard	3,900
Neighborhood Connector	Walnut Avenue	Wardlow Road	Spring Street	9,300
		Hill Street	Pacific Coast Highway	7,800
		Pacific Coast Highway	Anaheim Street	2,900
		Anaheim Street	10th Street	2,300
		10th Street	7th Street	2,500
		7th Street	4th Street	2,200
		4th Street	3rd Street	1,300
Major Avenue	Cherry Avenue	70th Street	Artesia Boulevard	21,000
		Artesia Boulevard	Harding Street	31,300
		Harding Street	South Street	23,400
		South Street	Market Street	25,500
		Market Street	Del Amo Boulevard	33,100

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Del Amo Boulevard	San Antonio Drive	43,200
		San Antonio Drive	Carson Street	14,700
		Carson Street	Bixby Road	17,600
		Bixby Road	Wardlow Road	18,100
		Wardlow Road	Spring Street	18,300
		Hill Street	Pacific Coast Highway	16,900
Minor Avenue	Cherry Avenue	Pacific Coast Highway	Anaheim Street	7,900
		Anaheim Street	10th Street	4,400
		10th Street	7th Street	5,700
Neighborhood Connector	Cherry Avenue	7th Street	4th Street	5,300
		4th Street	3rd Street	3,500
		3rd Street	Broadway	7,000
		Broadway	Ocean Boulevard	1,900
Major Avenue	Paramount Boulevard	70th Street	Artesia Boulevard	21,700
		Artesia Boulevard	South Street	31,000
		South Street	Market Street	24,800
Neighborhood Connector	Temple Avenue	Spring Street	Willow Street	12,900
		Willow Street	Hill Street	11,200
		Pacific Coast Highway	Anaheim Street	4,900
		Anaheim Street	10th Street	6,500
		10th Street	7th Street	2,500
		7th Street	4th Street	2,600
		4th Street	3rd Street	2,100
		3rd Street	Broadway	5,500
Neighborhood Connector	Obispo Avenue	70th Street	Artesia Boulevard	6,600
Minor Avenue	Downey Avenue	70th Street	Artesia Boulevard	22,300
		Artesia Boulevard	South Street	19,900
Major Avenue	Redondo Avenue	Spring Street	Willow Street	16,500
		Willow Street	Stearns Street	6,800
		Stearns Street	Pacific Coast Highway	15,100
		Pacific Coast Highway	Anaheim Street	20,600
		Anaheim Street	10th Street	16,800
		10th Street	7th Street	16,400
		7th Street	4th Street	10,700
Minor Avenue	Redondo Avenue	4th Street	3rd Street	4,200
		3rd Street	Broadway	2,700
Neighborhood Connector	Redondo Avenue	Broadway	Ocean Boulevard	2,900

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
Neighborhood Connector	Termino Avenue	Redondo Avenue	Pacific Coast Highway	7,200
		Pacific Coast Highway	Anaheim Street	8,400
		Anaheim Street	10th Street	9,600
		10th Street	7th Street	7,700
		7th Street	4th Street	13,000
		4th Street	3rd Street	5,400
Regional Corridor	Lakewood Boulevard	Del Amo Boulevard	Carson Street	32,700
		Carson Street	Cover Street	35,700
		Cover Street	Conant Street	35,700
		Conant Street	Wardlow Road	35,700
		Wardlow Road	Spring Street	55,000
		Spring Street	Willow Street	29,700
		Willow Street	Stearns Street	37,700
		Stearns Street	Pacific Coast Highway	34,500
Minor Avenue	Ximeno Avenue	North of	Pacific Coast Highway	18,300
		Pacific Coast Highway	Anaheim Street	18,800
Neighborhood Corridor	Ximeno Avenue	Anaheim Street	10th Street	12,700
		10th Street	7th Street	5,700
		7th Street	4th Street	6,100
		4th Street	3rd Street	4,500
		3rd Street	Broadway	4,100
		Broadway	Ocean Boulevard	4,100
Neighborhood Connector	Park Avenue	Anaheim Street	7th Street	13,200
		7th Street	4th Street	13,500
		4th Street	Broadway	4,700
		Broadway	2nd Street	7,900
Minor Avenue	Clark Avenue	Del Amo Boulevard	Carson Street	13,800
		Carson Street	Conant Street	17,200
		Conant Street	Wardlow Road	17,100
		Wardlow Road	Spring Street	3,800
		Spring Street	Willow Street	10,900
		Willow Street	Stearns Street	10,000
		Stearns Street	Atherton Street	7,400
		Atherton Street	Anaheim Street	7,700
Boulevard	Bellflower Boulevard	Del Amo Boulevard	Carson Street	23,300
		Carson Street	Conant Street	21,200
		Conant Street	Wardlow Road	20,100

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Wardlow Road	Spring Street	18,700
		Spring Street	Willow Street	27,000
		Willow Street	Stearns Street	31,400
		Stearns Street	Atherton Street	34,100
		Atherton Street	7th Street	28,700
		7th Street	Loynes Drive	13,400
Minor Avenue	Woodruff Avenue	Carson Street	Conant Street	21,900
		Conant Street	Wardlow Road	22,300
		Wardlow Road	Los Coyotes Diagonal	15,100
		Los Coyotes Diagonal	Spring Street	16,700
		Spring Street	Willow Street	14,500
Minor Avenue	Palo Verde Avenue	Carson Street	Conant Street	11,400
		Conant Street	Los Coyotes Diagonal	16,100
		Los Coyotes Diagonal	Wardlow Road	4,500
		Wardlow Road	Spring Street	5,100
		Spring Street	Willow Street	10,300
		Willow Street	Stearns Street	8,600
		Stearns Street	Atherton Street	8,700
		Atherton Street	Anaheim Street	6,400
Minor Avenue	Studebaker Road	Carson Street	Wardlow Road	10,500
		Wardlow Road	Spring Street	13,000
Major Avenue	Studebaker Road	Spring Street	Willow Street	21,300
		Willow Street	Atherton Street	11,500
		Atherton Street	Anaheim Street	10,500
		Anaheim Street	7th Street	20,500
		7th Street	Loynes Drive	32,800
		Loynes Drive	2nd Street	27,300
Neighborhood Connector	Pioneer Boulevard	South of	Carson Street	11,100
Major Avenue	Norwalk	North of	Wardlow Road	28,500
		South of	Wardlow Road	23,500
Neighborhood Connector	70th Street	Atlantic Avenue	Orange Avenue	25,900
		Paramount Boulevard	Obispo Avenue	21,300
		Obispo Avenue	Downey Avenue	21,300
Major Avenue	Artesia Boulevard	West of	Long Beach Boulevard	9,600
		Long Beach Boulevard	Atlantic Avenue	20,800
		Atlantic Avenue	Orange Avenue	22,500
		Orange Avenue	Cherry Avenue	16,400

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Cherry Avenue	Paramount Boulevard	12,900
		Paramount Boulevard	Obispo Avenue	16,600
		Obispo Avenue	Downey Avenue	17,900
Neighborhood Connector	Harding Street	Atlantic Avenue	Orange Avenue	4,100
		Orange Avenue	Cherry Avenue	2,600
Minor Avenue	Victoria Street	West of	Long Beach Boulevard	21,200
Minor Avenue	South Street	Atlantic Avenue	Orange Avenue	12,300
		Orange Avenue	Cherry Avenue	11,500
Major Avenue	South Street	Cherry Avenue	Paramount Boulevard	14,400
		Paramount Boulevard	Downey Avenue	17,600
		East of	Downey Avenue	22,300
Minor Avenue	Market Street	Long Beach Boulevard	Atlantic Avenue	7,300
		Atlantic Avenue	Orange Avenue	6,300
		Orange Avenue	Cherry Avenue	7,700
		Cherry Avenue	Paramount Boulevard	16,800
Major Avenue	Del Amo Boulevard	West of	Long Beach Boulevard	42,900
		Long Beach Boulevard	Atlantic Avenue	37,000
		Atlantic Avenue	Orange Avenue	28,500
		Orange Avenue	Cherry Avenue	27,500
		East of	Cherry Avenue	36,200
Minor Avenue	San Antonio Drive	Long Beach Boulevard	Atlantic Avenue	20,200
		Atlantic Avenue	Orange Avenue	25,000
		Orange Avenue	Cherry Avenue	29,000
Neighborhood Connector	Carson Street	East of	Santa Fe Avenue	300
Major Avenue	Carson Street	Atlantic Avenue	Orange Avenue	21,000
		Orange Avenue	Cherry Avenue	28,000
		East of	Cherry Avenue	35,100
		West of	Lakewood Boulevard	40,500
		Lakewood Boulevard	Clark Avenue	17,700
		Clark Avenue	Bellflower Boulevard	24,400
		Bellflower Boulevard	Woodruff Avenue	20,700

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Woodruff Avenue	Palo Verde Avenue	14,100
		Palo Verde Avenue	Studebaker Road	12,900
		Studebaker Road	Pioneer Boulevard	42,900
Neighborhood Connector	Bixby Road	Long Beach Boulevard	Atlantic Avenue	3,800
		Atlantic Avenue	Orange Avenue	3,800
		Orange Avenue	Cherry Avenue	900
Neighborhood Connector	Conant Street	Clark Avenue	Bellflower Boulevard	6,000
		Bellflower Boulevard	Woodruff Avenue	1,600
		Woodruff Avenue	Palo Verde Avenue	8,400
Major Avenue	Wardlow Road	West of	Santa Fe Avenue	31,700
		Santa Fe Avenue	Easy Avenue	26,300
		Easy Avenue	Magnolia Avenue	29,700
		Magnolia Avenue	Pacific Avenue	22,700
		Pacific Avenue	Long Beach Boulevard	23,300
Minor Avenue	Wardlow Road	Long Beach Boulevard	Atlantic Avenue	14,000
		Atlantic Avenue	Orange Avenue	7,400
		Orange Avenue	Cherry Avenue	4,100
		Lakewood Boulevard	Clark Avenue	20,700
		Clark Avenue	Bellflower Boulevard	10,600
		Bellflower Boulevard	Woodruff Avenue	16,600
		Woodruff Avenue	Los Coyotes Diagonal	11,900
		Los Coyotes Diagonal	Palo Verde Avenue	16,800
		Palo Verde Avenue	Studebaker Road	19,600
		Studebaker Road	Norwalk	31,100
Minor Avenue	Spring Street	#REF!	Long Beach Boulevard	13,800
Major Avenue	Spring Street	Long Beach Boulevard	Atlantic Avenue	10,500
		Atlantic Avenue	Orange Avenue	15,400
		Orange Avenue	Cherry Avenue	17,500
		Cherry Avenue	Temple Avenue	21,900
		Temple Avenue	Redondo Avenue	23,700
		Redondo Avenue	Lakewood Boulevard	12,400
		Lakewood Boulevard	Clark Avenue	30,500
		Clark Avenue	Bellflower Boulevard	24,200
		Bellflower Boulevard	Los Coyotes Diagonal	17,500
		Los Coyotes Diagonal	Woodruff Avenue	16,900
		Woodruff Avenue	Palo Verde Avenue	19,800
		Palo Verde Avenue	Studebaker Road	22,600

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		East of	Studebaker Road	25,400
Major Avenue	Willow Street	West of	Santa Fe Avenue	39,500
		Santa Fe Avenue	Easy Avenue	36,500
		Easy Avenue	Magnolia Avenue	42,700
		Magnolia Avenue	Pacific Avenue	32,900
		Pacific Avenue	Long Beach Boulevard	45,200
		Long Beach Boulevard	Atlantic Avenue	42,500
		Temple Avenue	Redondo Avenue	36,800
		Redondo Avenue	Lakewood Boulevard	33,500
		Lakewood Boulevard	Clark Avenue	31,700
		Clark Avenue	Bellflower Boulevard	28,300
		Bellflower Boulevard	Woodruff Avenue	34,500
		Woodruff Avenue	Palo Verde Avenue	44,900
		Palo Verde Avenue	Studebaker Road	37,800
		East of	Studebaker Road	35,000
Neighborhood Connector	Hill Street	Magnolia Avenue	Pacific Avenue	2,500
		Pacific Avenue	Long Beach Boulevard	2,400
		Long Beach Boulevard	Atlantic Avenue	1,200
		Atlantic Avenue	Martin Luther King Jr Avenue	2,300
		Martin Luther King Jr Avenue	Orange Avenue	2,800
Neighborhood Connector	Stearns Street	Redondo Avenue	Lakewood Boulevard	9,100
		Lakewood Boulevard	Clark Avenue	5,000
Minor Avenue	Stearns Street	Clark Avenue	Bellflower Boulevard	7,700
		Bellflower Boulevard	Palo Verde Avenue	9,400
Regional Corridor	Pacific Coast Highway	Terminal Island Freeway	Santa Fe Avenue	46,500
		Santa Fe Avenue	Easy Avenue	49,200
		Easy Avenue	Magnolia Avenue	46,400
		Magnolia Avenue	Pacific Avenue	46,700
		Pacific Avenue	Long Beach Boulevard	53,100
		Long Beach Boulevard	Atlantic Avenue	41,900
		Atlantic Avenue	Martin Luther King Jr Avenue	48,900

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Martin Luther King Jr Avenue	Orange Avenue	41,800
		Orange Avenue	Walnut Avenue	59,600
		Walnut Avenue	Cherry Avenue	56,200
		Cherry Avenue	Temple Avenue	67,200
		Temple Avenue	Redondo Avenue	62,700
		Redondo Avenue	Termino Avenue	64,800
		Termino Avenue	Lakewood Boulevard	70,800
		Lakewood Boulevard	Clark Avenue	34,700
		Clark Avenue	7th Street	47,600
		7th Street	Loynes Drive	38,700
		Loynes Drive	2nd Street	44,200
		South of	2nd Street	50,400
Boulevard	Los Coyotes Diagonal	Lakewood Boulevard	Clark Avenue	49,600
		Clark Avenue	Bellflower Boulevard	49,500
		Bellflower Boulevard	Woodruff Avenue	41,900
		Woodruff Avenue	Palo Verde Avenue	41,800
		Palo Verde Avenue	Studebaker Road	28,300
Major Avenue	Anaheim Street	West of	Santa Fe Avenue	37,100
		Santa Fe Avenue	Magnolia Avenue	42,400
		Magnolia Avenue	Pacific Avenue	30,300
		Pacific Avenue	Long Beach Boulevard	34,200
		Long Beach Boulevard	Atlantic Avenue	27,300
		Atlantic Avenue	Martin Luther King Jr Avenue	29,500
		Martin Luther King Jr Avenue	Orange Avenue	29,400
		Orange Avenue	Walnut Avenue	25,700
		Walnut Avenue	Cherry Avenue	25,100
		Cherry Avenue	Temple Avenue	28,200
		Temple Avenue	Redondo Avenue	30,900
		Redondo Avenue	Termino Avenue	30,700
		Termino Avenue	Ximeno Avenue	32,300
		Ximeno Avenue	Pacific Coast Highway	24,300
Major Avenue	9th Street	West of	Santa Fe Avenue	14,900
		East of	Santa Fe Avenue	18,900
Minor Avenue	10th Street	Magnolia Avenue	Pacific Avenue	6,500
		Pacific Avenue	Long Beach Boulevard	7,200

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Long Beach Boulevard	Atlantic Avenue	10,900
		Atlantic Avenue	Martin Luther King Jr Avenue	10,300
		Martin Luther King Jr Avenue	Orange Avenue	15,200
		Orange Avenue	Walnut Avenue	11,400
		Walnut Avenue	Cherry Avenue	10,200
		Cherry Avenue	Temple Avenue	13,100
		Temple Avenue	Redondo Avenue	11,200
Neighborhood Connector	10th Street	Redondo Avenue	Termino Avenue	10,500
		Termino Avenue	Ximeno Avenue	12,300
Boulevard	7th Street	West of	Magnolia Avenue	9,000
		Magnolia Avenue	Pacific Avenue	9,900
		Pacific Avenue	Long Beach Boulevard	15,300
		Long Beach Boulevard	Atlantic Avenue	10,800
		Atlantic Avenue	Martin Luther King Jr Avenue	16,000
		Martin Luther King Jr Avenue	Orange Avenue	31,500
		Orange Avenue	Walnut Avenue	36,900
		Walnut Avenue	Cherry Avenue	37,800
		Cherry Avenue	Temple Avenue	46,800
		Temple Avenue	Redondo Avenue	44,400
		Redondo Avenue	Termino Avenue	40,100
		Termino Avenue	Ximeno Avenue	46,400
		Ximeno Avenue	Park Avenue	47,300
		Park Avenue	Bellflower Boulevard	47,100
		Bellflower Boulevard	Studebaker Road	82,300
Major Avenue	6th Street	Shoreline Drive	Magnolia Avenue	10,700
		Magnolia Avenue	Pacific Avenue	11,300
		Pacific Avenue	Long Beach Boulevard	16,200
		Long Beach Boulevard	Atlantic Avenue	8,200
		Atlantic Avenue	Alamitos Avenue	11,300
Minor Avenue	4th Street	Alamitos Avenue	Orange Avenue	10,300
		Orange Avenue	Walnut Avenue	9,900
		Walnut Avenue	Cherry Avenue	8,900
		Cherry Avenue	Temple Avenue	9,400

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Temple Avenue	Redondo Avenue	9,500
Neighborhood Connector	4th Street	Redondo Avenue	Termino Avenue	5,900
		Termino Avenue	Ximeno Avenue	10,900
		Ximeno Avenue	Park Avenue	8,200
Neighborhood Connector	Eliot	Park Avenue	Bellflower Boulevard	5,100
Neighborhood Connector	Loynes	Bellflower Boulevard	Studebaker Road	11,600
Neighborhood Connector	Appian	Park Avenue	2nd Street	4,700
Major Avenue	3rd Street	Shoreline Drive	Magnolia Avenue	4,000
		Magnolia Avenue	Pacific Avenue	13,400
		Pacific Avenue	Long Beach Boulevard	15,300
		Long Beach Boulevard	Atlantic Avenue	12,800
		Atlantic Avenue	Alamitos Avenue	14,100
Neighborhood Connector	3rd Street	Alamitos Avenue	Orange Avenue	6,600
		Orange Avenue	Walnut Avenue	9,700
		Walnut Avenue	Cherry Avenue	9,700
		Cherry Avenue	Temple Avenue	4,700
		Temple Avenue	Redondo Avenue	6,000
		Redondo Avenue	Termino Avenue	1,400
		Termino Avenue	Ximeno Avenue	400
Major Avenue	Broadway	West of	Magnolia Avenue	6,300
		Magnolia Avenue	Pacific Avenue	15,500
		Pacific Avenue	Long Beach Boulevard	15,600
		Long Beach Boulevard	Atlantic Avenue	14,100
		Atlantic Avenue	Alamitos Avenue	15,200
Minor Avenue	Broadway	Alamitos Avenue	Orange Avenue	13,700
		Orange Avenue	Cherry Avenue	12,800
		Cherry Avenue	Temple Avenue	18,700
		Temple Avenue	Redondo Avenue	16,100
		Redondo Avenue	Ximeno Avenue	8,500
		Ximeno Avenue	Park Avenue	7,500
Regional Connector	Ocean Boulevard	West of	Harbor Scenic	42,500
Boulevard		Harbor Scenic	Shoreline Drive	28,900

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.

Classification	Roadway Segment	Between		Existing ADT*
		Shoreline Drive	Magnolia Avenue	30,400
		Magnolia Avenue	Shoreline Drive	50,500
		Shoreline Drive	Orange Avenue	30,700
		Orange Avenue	Cherry Avenue	32,000
		Cherry Avenue	Temple Avenue	28,900
		Temple Avenue	Redondo Avenue	31,200
Neighborhood Connector	Ocean Boulevard	East of	2nd Street	10,600
Boulevard	2nd Street	Ocean Boulevard	Ximeno Avenue	30,200
		Ximeno Avenue	Park Avenue	34,200
		Park Avenue	Appian	37,700
		Appian	Pacific Coast Highway	47,300
		Pacific Coast Highway	Studebaker Road	38,900
		East of	Studebaker Road	32,300
Boulevard	Shoreline Drive	North of	6th Street	20,000
		6th Street	3rd Street	29,900
		3rd Street	Ocean Boulevard	35,100
		Ocean Boulevard	Magnolia Avenue	25,200
		Magnolia Avenue	Ocean Boulevard	24,700
Interstate	I-710 Freeway	Anaheim Street to Pacific Coast Highway		133,000
		Willow Street to I-405		168,000
		I-405 to Del Amo Boulevard		184,000
		Long Beach Boulevard to SR-91		199,000
Interstate	I-405 Freeway	East of Studebaker Road		261,000
		Studebaker Road to Palo Verde Avenue		267,000
		Palo Verde Avenue to Woodruff Avenue		257,000
		Woodruff Avenue to Bellflower Boulevard		262,000
		Bellflower Boulevard to Lakewood Boulevard		274,000
		Lakewood Boulevard to Cherry Avenue		282,000
		Atlantic Avenue to Long Beach Boulevard		283,000
Interstate	I-605 Freeway	Los Alamitos to Spring Street		167,000
State Route	SR-91	Alameda Street to Long Beach Boulevard		223,000
		Paramount Boulevard to Downey Avenue		273,000
State Route	SR-22	Studebaker Road to Los Angeles/Orange County Line		98,000

*The Existing ADT is based on the City of Long Beach 2013 Mobility Element.