APPENDIX E

NOISE AND VIBRATION TECHNICAL REPORT

Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Maximum Sound Level (L_{max})**. The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.

- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.

- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.

- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level
± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2013, September. Transportation and Construction Vibration Guidance Manual.

LOCAL REGULATIONS AND STANDARDS

Evacuation is another component of disaster preparedness.. While the freeways are the most logical routes out of town, they could potentially be impassable following a major earthquake. Arterial streets, particularly Doolittle, East 14th, San Leandro Boulevard, Washington, Halcyon/ Fairmont, Bancroft/Hesperian, and MacArthur/Foothill would function as the major routes out of the City if evacuation became necessary. A formal evacuation plan should be prepared as part of the City's ongoing emergency preparedness program.

Post-disaster response includes the provision of shelter, food, medical assistance, and financial aid, and the rebuilding process. Mobile medical and communication equipment is also needed to improve readiness. Future revisions to the Emergency Management Plan should include programs to address immediate needs after a disaster strikes, and the longer-term needs associated with recovery and reconstruction.

E. NOISE

San Leandro's location in the heart of a major metropolitan area makes it susceptible to noise conflicts. Each day, hundreds of thousands of cars pass through the City on freeways and major thoroughfares. Large and small planes pass over the City throughout the day and night, many flying at low altitudes to and from Oakland International Airport. Freight and passenger trains, BART trains, buses, and trucks produce noise and vibration impacts in many San Leandro neighborhoods. Even in relatively quiet parts of the City, domestic noise sources such as leaf blowers, home and car stereos, security alarms, and barking dogs can be a source of annoyance.

In San Leandro, as in all communities, maintaining neighborhood "peace and quiet" is a basic part of protecting the quality of life. San Leandro residents and businesses, and the City itself, have invested a great deal of time and energy to deal with noise proactively by mitigating existing conflicts and protecting the City from future conflicts. Cities are required to address noise issues in their general plans, primarily by promoting development patterns that recognize the sources of noise and the locations of noise-sensitive uses. This General Plan achieves that objective while also expressing the City's ongoing commitment to reduce noise conflicts in the community.

The following sections of this Element describe the noise environment in San Leandro, the major issues to be resolved, and the strategies for mitigating noise problems. Policies and actions under Goals EH-7, EH-8, and EH-9 set forth a coordinated program to address stationary, transportation, and aircraft noise issues in the future.

Existing and Projected Noise Environment

The text box on page 7-30 provides an overview of how noise is measured. Chart 7-1 indicates the noise levels associated with typical sounds in an urban environment.

Noise levels can be expressed graphically through the use of contour diagrams. Figure 7-5 shows noise contours in San Leandro in 2015 based on traffic volumes and noise monitoring conducted as part of the General Plan update. Each contour band shown on the map corresponds to the approximate noise level generated at that location shown . The contours represent approximations only—the actual noise level at any given location depends on a number of factors, such as topography, vegetation and building cover.

In a Nutshell...

How Noise is Measured

Human perception of noise is usually defined in **decibels (dB)**. Decibels are measured on a logarithmic scale, which means that each increase of 10 dB is equivalent to a doubling in loudness. The measurements are usually taken on an "A-weighted" scale which filters out very low and very high frequencies. Everyday sounds range from 20 dB, which is very quiet, to over 100 dB, which is very noisy. Above 70 dB, noise can become irritating and disruptive.

Noise measurements are usually expressed with some indication of the duration of the measurement period. For longer periods, the measurement reflects the average noise level over the period. Adjustments are usually made to reflect the greater sensitivity of people to noise at night. The term **Community Noise Equivalent Level** (CNEL) is used to describe the average noise level during a 24-hour period, with a penalty of 5 dB added to sound levels between 7 and 10 PM, and a penalty of 10 DB added to sound levels between 10 PM and 7 AM. The term **Day-Night Average Level (Ldn)** is similar, but only includes the 10 dB penalty for 10 PM – 7 AM noise. Shorter measurement durations, typically one hour, are described in **Energy Equivalent Levels** (Leq), indicating the total energy contained by sound over a given sample period.

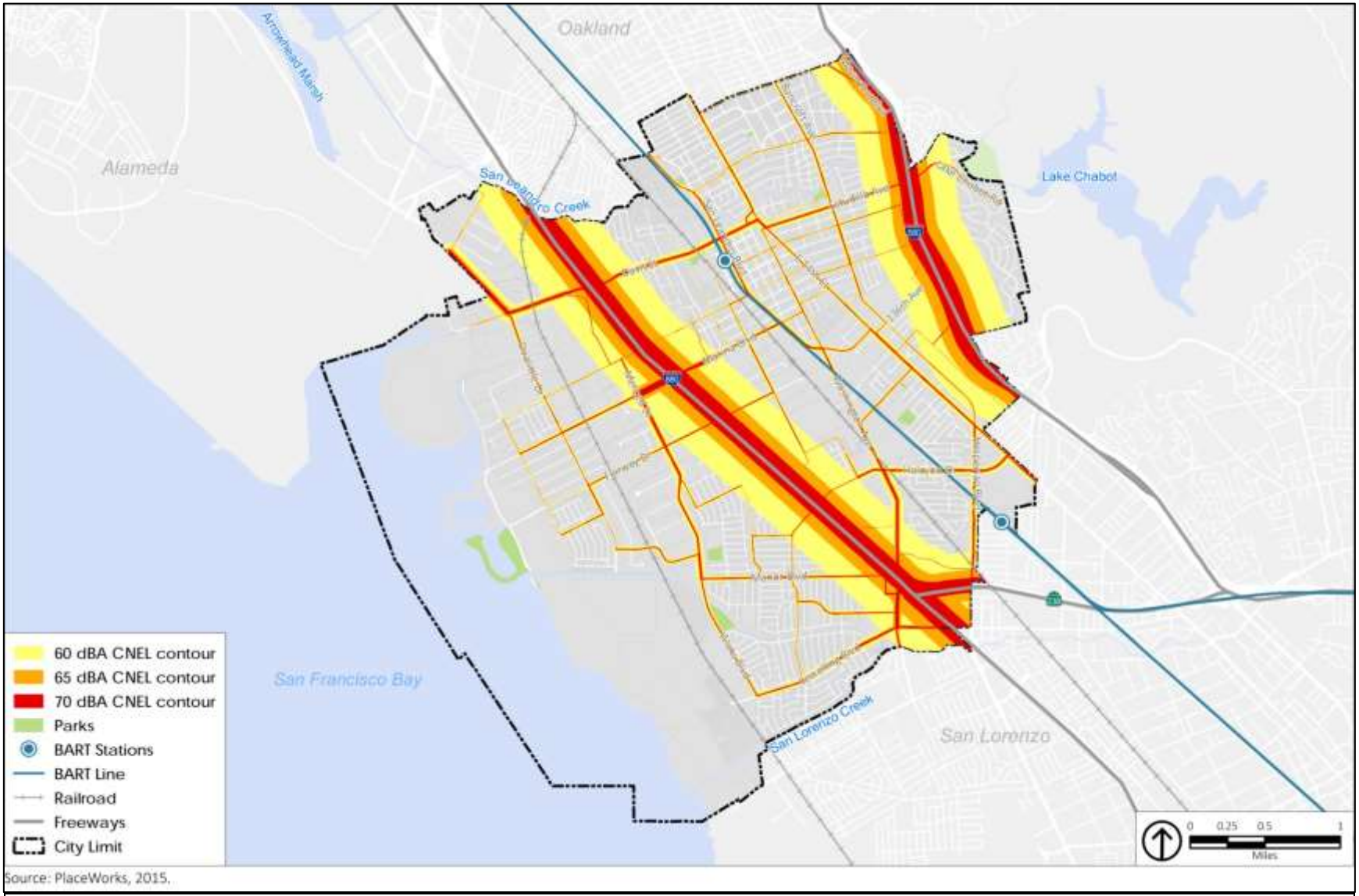
Use of the longer measurement periods accounts for the variations in the frequency of sound levels that may occur during the day. For instance, a landing jet airplane may produce a sustained noise level of 75 dB as it passes over a particular site in San Leandro. The CNEL reading would be much lower, since the noise is not continuous throughout the day and night.

The US Environmental Protection Agency has suggested an exterior noise goal of 55 dB (Ldn) in residential areas. The US Department of Housing and Urban Development's minimum standard is 65 dB (Ldn). Most local governments use 60 dB (Ldn) as the limit for exterior noise exposure in new residential areas. As a guideline, interior noise levels should be no louder than 45 dB (Ldn). Since the noise reduction provided by a typical house is about 20-25 dB with the windows closed, special insulation measures are usually required where exterior noise exceeds 60 dB.

CHART7-1: TYPICAL SOUND LEVELS IN AN URBAN ENVIRONMENT

Perceived Sound Level	Sound Level (dB)	Examples
Painfully Loud	160	Fireworks at 3 feet
	150	Jet takeoff
	140	Threshold of pain
Uncomfortably Loud	130	Power drill
	120	Thunder
	110	Auto horn at 3 feet, Rock band
Very Loud	100	Snowmobile, Pile driver
	90	Diesel truck, lawn mower at 3 feet
	80	Garbage disposal, Siren at 100′
Moderately Loud	70	Vacuum cleaner, leaf blower at 50′
	60	Ordinary conversation
	50	Average home, light traffic
Quiet	40	Library
	30	Quiet conversation
Very Quiet	20	Soft whisper
	10	Rustling leaves
Barely Audible	0	Threshold of hearing

Source: California Air Resources Board



Source: PlaceWorks, 2015.

SAN LEANDRO 2035

Figure 7-5

Noise Contours-2015

Figure 7-5 illustrates that many parts of San Leandro are located in areas where ambient noise levels exceed 60 dB Ldn. A substantial number of homes are within the 65 dB Ldn contour, indicative of a relatively noisy exterior environment. The 60 and 65 dB contours form bands parallel to the city's freeways, railroads, and major arterials. Noise monitoring conducted as part of the General Plan indicated noise levels of 65-67 dB CNEL at locations near the freeway and BART tracks. Sound walls have been constructed in many places to reduce noise levels.

Figure 7-6 illustrates projected noise contours in 2035. Although traffic increases on San Leandro streets are expected, little change to the ambient noise environment is expected. Noise increases of less than 3 dB L_{dn} over a long period of time are generally not perceptible. There are only a few locations in the city where increases of this magnitude are expected in the next 20 years, principally where existing noise levels are relatively low.

Noise Compatibility

Given the potential for adverse psychological and physiological impacts, some land uses are considered to be more sensitive to noise than others. Residential areas, schools, child care centers, hospitals, churches, libraries, and nursing homes are typically regarded as noise-sensitive. Certain types of park and recreational areas also may be noise-sensitive. It is important that future land use decisions protect such uses and further, that new noise-sensitive uses are located and designed in a way that protects occupants from harmful noise impacts.

Chart 7-2 provides noise compatibility guidelines for land uses based on State of California guidelines. The guidelines identify those areas where various uses are acceptable, conditionally acceptable, normally unacceptable, or clearly unacceptable based on ambient noise levels. The guidelines recognize that mitigation may make certain uses acceptable, even where exterior noise levels are relatively high. This is important in San Leandro, given the number of future housing sites located near BART, an area with relatively high ambient noise levels.

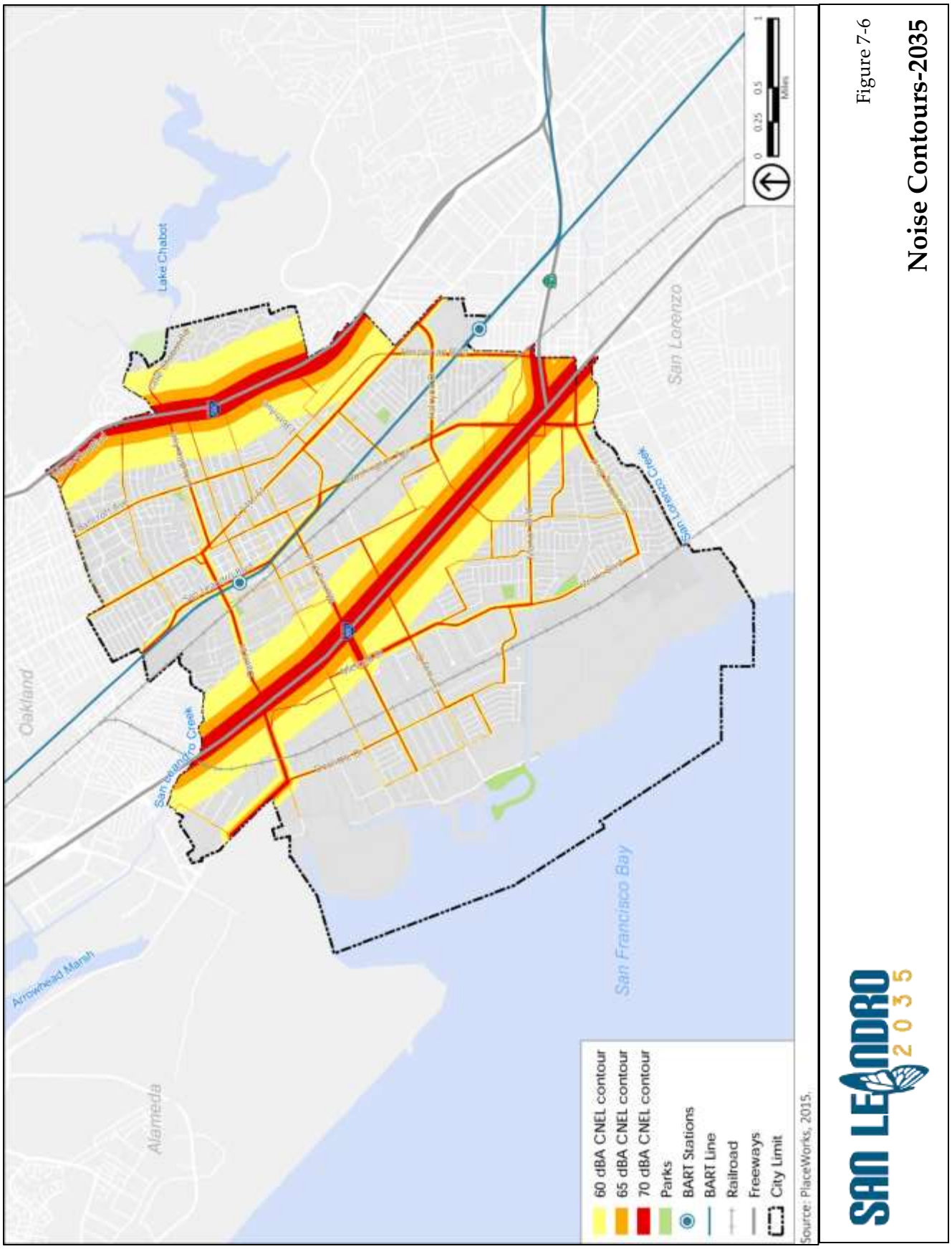
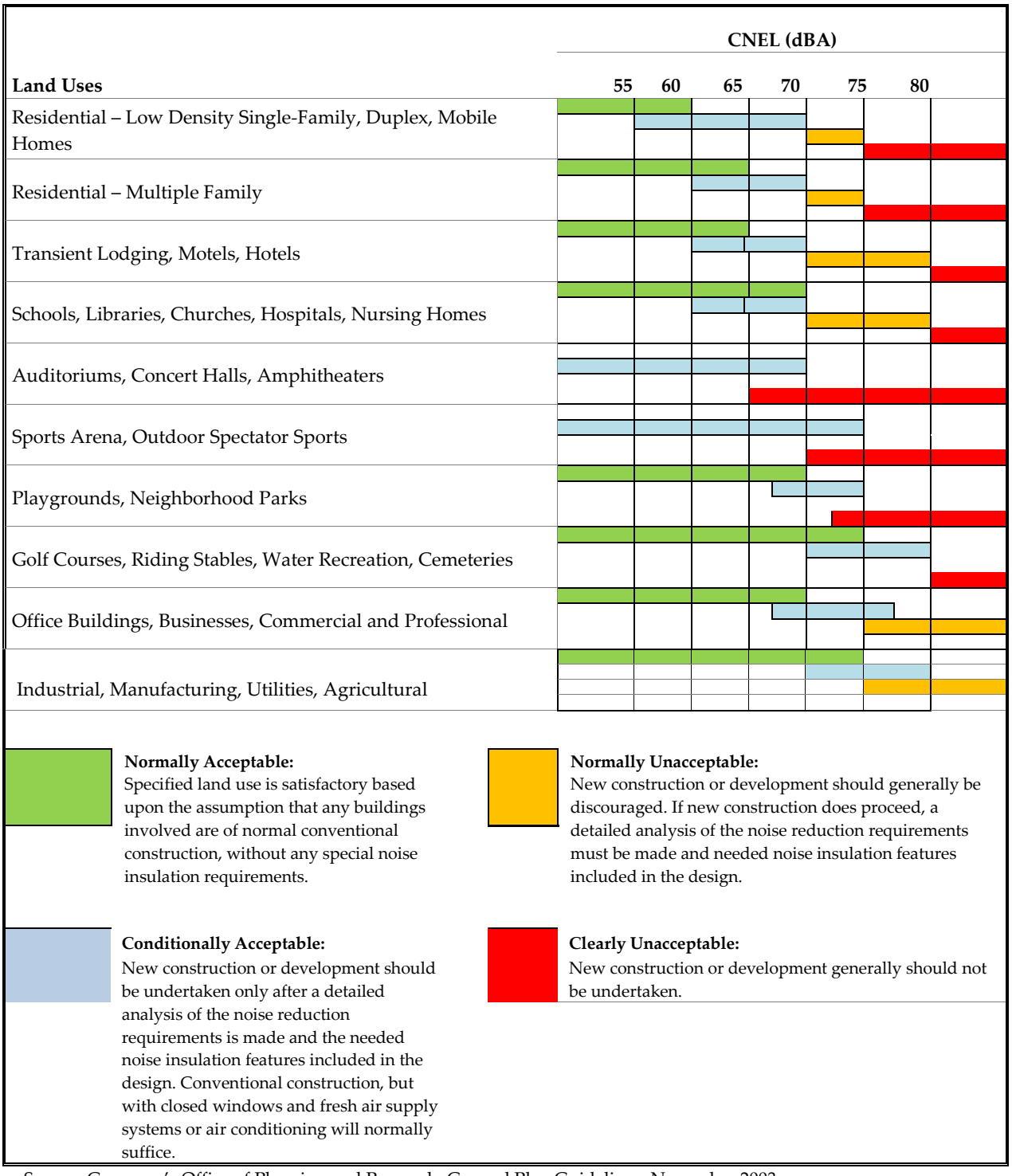


Figure 7-6

Noise Contours-2035

CHART 7-2: SAN LEANDRO LAND USE COMPATIBILITY GUIDELINES



Source: Governor's Office of Planning and Research, General Plan Guidelines, November 2003.

Noise mitigation is achieved by reducing the source of the noise, modifying the path between the noise source and receiver, or adjusting the noise receiver. These approaches are described below:

- Reducing noise at the source usually involves muffling the sound, replacing noisy equipment, or regulating the hours during which the source is in operation. For example, federal regulations require mufflers on cars, hush kits on jet airplanes, and curfews at some airports.
- Modifying the path between source and receiver can be accomplished with barriers such as sound walls, berms, or vegetation.
- Adjusting the noise receiver is typically done through building orientation, design, and construction. Double-paned windows, carpeting, acoustical ceiling tiles, and insulation are all examples of ways to reduce noise interior levels at the receiving end.

The California Building Code includes noise insulation standards to limit the extent of noise transmitted into habitable spaces. These standards indicate the extent to which walls, doors, floors, and ceilings must block or absorb sound between exterior and interior spaces. An interior standard of 45 dBA CNEL is required for any habitable room. The City requires an acoustical analysis to demonstrate how dwelling units have been designed to meet this standard on sites where the ambient exterior noise level exceeds 60 dBA CNEL.

Stationary and Construction Noise

Stationary noise sources include industrial and commercial operations, and domestic activities. Construction noise, while temporary, can be a significant contributor to ambient noise levels. Cities can exercise more control over these sources than mobile sources such as trains and aircraft. This control is typically exercised through zoning and through the enforcement of local ordinances regulating noise and business activities.

Many uses in San Leandro's industrial areas generate noise through their regular operations. Generators, fans, chillers, boilers, compressors, pumps, mechanical equipment, and air conditioning systems may run 24 hours a day in some locations. Other sources, such as horns, buzzers, and merchandise off-loading, may be more intermittent. Industrial noise sources are of greatest concern when they are close to sensitive receptors

such as housing. This is the case in some West San Leandro neighborhoods and on the perimeter of the Washington Avenue industrial area. Monitors indicate that noise levels exceed 60 dB Ldn in many of the city's industrial areas and may exceed 70 dB Ldn where other significant noise sources (such as railroad tracks or freeways) are also present.

In commercial areas, noise from restaurants, bars, car washes, and other businesses may create conflicts with adjacent residential uses. Commercial uses can generate noise from heating, ventilation, and air conditioning systems, loading docks, trash compactors, and mechanical equipment. Related vehicle and truck traffic can also be a source, and certain activities such as outdoor dining or live music can be objectionable to neighbors.

The City presently uses development review and zoning—specifically, the conditional use permit process—to limit the hours of operation for noise-producing activities and to identify noise muffling and buffering requirements. Shielding equipment may be required for industrial operations and measurable noise limits may be set for air conditioners, compressors, and other exterior noise sources. Similarly, the City requires noise mitigation by residential developers when homes are placed near freeways, industrial uses, and other noise sources. This may include sound walls, double-paned windows, and other measures that protect future residents while helping nearby industrial and commercial uses remain viable.

Construction and demolition noise may occur anywhere in the city. Although it is temporary and intermittent, such noise can be particularly intrusive because of its very high output and repetitive nature. At a distance of 50 feet, a pile driver and jackhammer may generate noise levels exceeding 100 dBA and 88 dBA respectively (see Chart 7-1). Construction scheduling requirements are typically established to ensure that such noise is limited in duration and occurs only during daytime hours. Contractors may also be required to use equipment with mufflers, silencers, and low noise emission features to avoid potential problems.

Most domestic noise sources are associated with home appliances, yard maintenance and home construction equipment, air conditioners, power tools, hot tubs, and other household activities. Loud music, yelling, and barking dogs are also the source of frequent complaints. The City treats such complaints as a police matter and relies on the Municipal Code to address them.

Chapter 4-1 of the San Leandro Municipal Code restricts the hours of operation of sound amplifying equipment and states that noise is considered a nuisance if it disturbs a person with "normal sensitivity." The Municipal Code includes specific provisions related to loud music in parks, operation of loud equipment, and construction activities. It does not specify allowable decibel levels at the source or at residential property lines. The Code identifies the criteria to identify violations, including sound levels, time, duration, recurrent vs intermittent, proximity to residential uses, population density, and the nature of the noise itself.

Transportation Noise

The heavy volume of traffic in and around San Leandro results in high noise levels in many parts of the City. The Nimitz Freeway (I-880) was built before effective noise standards were in place and has residential uses along 60 percent of its San Leandro frontage. Portions of the roadway are elevated and the freeway is a major interstate truck route. Sound walls have been constructed along all segments abutted by residential uses within San Leandro.

The MacArthur Freeway (I-580) has historically been less of a problem, in part due to its design, but also because of the low volume of truck traffic and relatively low night-time volumes. The abutting uses are almost entirely residential and are very sensitive to noise impacts due to the varying topography. Sound walls have been constructed along several segments of I-580.

Arterial roads such as Davis Street, Washington Avenue, Marina Boulevard, and East 14th Street all carry high traffic volumes. Ambient noise levels along these streets usually exceeds 60 dB CNEL, requiring noise mitigation measures in new construction.

The three Union Pacific Railroad corridors that cross San Leandro also affect adjacent uses, although the Oakland Subdivision (the line furthest east) is inactive. Data from the federal Railroad Administration indicates that more than 50 trains a day pass through the city. Passing trains are among the loudest noise sources in the city, exceeding 95 dBA at 100 feet. Train horns may be even louder, approaching 110 dBA. Brakes, coupling impacts, and crossing guard warnings are also common sources of noise along the railroads.

In some parts of central San Leandro, the impacts are amplified because the rail lines run parallel to and relatively close to the elevated BART tracks. BART carries 203 northbound trains and 203 southbound trains through the city each weekday. The cumulative effect of these sources makes it imperative that noise mitigation measures be incorporated for any development in that corridor.

The most common approach to reducing transportation noise in San Leandro in the past has been to construct sound walls. Although such walls are usually welcomed by immediately adjoining property owners, they are almost always controversial. The aesthetic impacts of a sound wall can be significant and there are often concerns about the displacement of sound to other locations.

A balanced approach to mitigating transportation noise is recommended in this General Plan, with sound walls used in some locations and other measures used where feasible. These measures might include the use of rubberized asphalt or other changes to streets and highway pavement, the use of quieter BART trains and AC Transit buses, and restrictions on train horns and the scheduling of train switching operations. Improved technology for the muffling of sound from automobiles, trucks, and motorcycles (including the increased use of electric cars) may result in

reduced noise levels in the future. It is also important to ensure that aesthetic and maintenance considerations are fully considered when sound walls are built. Dense plantings of shrubs and trees, for example, can soften the visual effects of a wall while also absorbing additional sound waves.

Additional noise problems can be avoided by ensuring that new development along freeways, arterials, and railroads is designed to minimize exposure to transportation noise. For example, the design of housing adjacent to the BART line should place the more noise-sensitive rooms such as bedrooms away from the tracks, while less sensitive rooms such as garages, closets, and utility areas may be closer to the tracks. The use of solid walls and reduced window openings facing the noise source also can cut down noise levels. Courtyards may be incorporated to create quieter spaces in buildings with otherwise noisy exterior settings. Balconies should be avoided where they would overhang noisy streets or face train tracks.

Airport Noise

Airport noise has been a persistent issue in San Leandro since the 1950s and became a greater concern during Oakland International Airport's growth during the 1980s and 90s. Between 1990 and 2000, passenger volumes increased from 5.5 million to 10.6 million. In 2015, the airport handled 11.2 million passengers, which is down from the 2007 peak of 14.2 million passengers. The airport also handles a considerable amount of air cargo and general aviation traffic. Much of this traffic uses runways that are located less than a mile from the San Leandro city limits. The City is also affected by noise from planes landing and taking off at Hayward Executive Airport, which is four miles to the south, and to a lesser extent at San Francisco International, which is 12 miles to the west.

Oakland International Airport is subdivided into North and South airfields. The North Field contains three runways (10L/28R, 10R/28L, and 15/33), as well as general aviation, maintenance, and some cargo facilities. The South Field includes the commercial passenger runways (12/30) and most cargo facilities. The flight path impacting San Leandro most directly is associated with landing aircraft on Runway 28R at the North Field. Most descending aircraft pass over Marina Square, the Timothy Drive/Davis West area, and the Adams Street industrial area before touching down. Helicopters also use this corridor.

The City is also impacted by commercial flights using Runway 12/30. Although planes taking off and landing on this runway do not pass directly over San Leandro, the area between the runway and the San Leandro shoreline is open water, providing few opportunities for sound to be absorbed. Consequently, the San Leandro Shoreline and adjacent waterfront neighborhoods may experience high noise levels. Residential areas also may be impacted by high levels of airport noise when flight patterns are shifted due to inclement weather.

Although all of San Leandro's residential areas fall outside of the "Noise Impact Boundary" defined by the Federal Aviation Administration (FAA) and the Port of Oakland, many San Leandro residents are still concerned with high noise levels. These concerns include late night arrivals and departures, low-flying aircraft, engine run-ups, and the frequency of overflights. While the 24-hour ambient noise levels are within levels deemed acceptable by the FAA, some areas experience short-duration incidents where noise levels exceed 70 dBA.

The Port of Oakland has been implementing a Noise Compatibility Program (NCP) for Oakland Airport since the 1970s. The current NCP includes a variety of components for both the North and South Fields to reduce off-site impacts. For instance, certain types of aircraft are prohibited from departing or arriving on the North Field, and aircraft must follow particular flight tracks when landing and taking off. Educational training and program information is used to advise pilots of the preferred procedures. A permanent noise monitoring system also has been installed.

The last 20 years have seen significant improvements to the airport-related noise environment in San Leandro. In 1994, there were 28 residences within Oakland International Airport's 65 dB CNEL contour and 554 residences within the Airport's 60 dB CNEL contour. Today, there are no homes in airport-related noise contours exceeding 60 dB, largely as a result of quieter aircraft. Noise mitigation programs are specified in a Settlement Agreement reached between the City of San Leandro and the Port of Oakland in November 2000 and amended through 2017. The Agreement prohibits the Airport from allowing large or heavy commercial passenger aircraft on the North Field, except during emergencies and periods when the main runway is closed for maintenance or repair. Most of the terms of the Settlement Agreement have already been met, including the offer to insulate additional homes to reduce interior noise levels. A Community Noise Management Forum has been created to regularly address community noise concerns; San Leandro is a regular participant in this process.

The City will continue to maintain a dialogue with the Port of Oakland on further noise abatement procedures, particularly in residential areas impacted by overflights and in areas between the 55 and 65 dB CNEL contours. The City will continue to be an active participant in discussions about the airport's future and will ensure that future development decisions consider the potential for exposure to airport noise. Through its participation in the Noise Management Forum, San Leandro will work to reduce noise impacts associated with implementation of new flight pattern protocols at Bay Area airports. In 2016, several East Bay cities were experiencing impacts from the Metroplex air traffic control system, which has resulted in more concentrated air traffic patterns. San Leandro will work with Congressional representatives and others to bring FAA oversight and regulations up to date to address and to resolve increased noise impacts on the community.

NOISE COMPATIBILITY

GOAL EH-7 **Ensure that noise associated with the day-to-day activities of San Leandro residents and businesses does not impede the peace and quiet of the community.**

Policy EH-7.1 **Noise Compatibility Table.** Ensure that potential noise impacts are considered when new development is proposed. Projects that could significantly increase noise levels should incorporate mitigation measures to reduce such impacts. Apply the standards shown in Chart 7-2 when evaluating applications for future development. Chart 7-2 specifies the maximum noise levels that are normally acceptable, conditionally acceptable, and normally unacceptable for new development.

Action EH-7.1.A: Review of Future Development Proposals
On an on-going basis, review future development proposals for compliance with the General Plan Noise and Land Use Compatibility standards in Chart 7-2. Require acoustical studies for projects that are likely to be exposed to noise levels that exceed the "normally acceptable" standard and for projects that are likely to generate noise in excess of these standards. Impose mitigation measures based on the findings. Noise studies should consider the effects of significant short-term noise sources (such as passing trains or planes) as well as the average noise levels that may be experienced over a 24-hour period.

Policy EH-7.2 **Residential Interior Noise Standard.** As required by the State of California, ensure that interior noise levels in new residential construction do not exceed 45 dB Ldn. For non-residential construction, the acceptable interior noise levels should be determined on a case by case basis, depending on the type of activity proposed.

Action EH-7.2.A: Insulation Standards
Continue to enforce Title 24 insulation standards for all new residential construction, including the interior noise level standard of 45 dBA Ldn in all habitable rooms for dwelling units.

Policy EH-7.3 **Residential Exterior Noise Standard.** Strive to maintain an exterior noise level of no more than 60 dB Ldn in residential areas. Recognizing that some San Leandro neighborhoods already exceed this noise level, encourage a variety of noise abatement measures that benefit these areas.

Policy EH-7.4 **Degradation of Ambient Noise Levels.** If a neighborhood is well within acceptable noise standards, do not automatically allow noise levels to degrade to the maximum tolerable levels shown in Chart 7-2. A project's noise impacts should be evaluated based on the potential for adverse community response, as well as its conformance to the adopted standards. For CEQA purposes, an increase of 3 dB Ldn should generally be considered a significant adverse impact.

Policy EH-7.5: **Noise-Sensitive Uses.** Discourage noise-sensitive uses such as hospitals, schools, and rest homes from locating in areas with very high noise levels unless sufficient noise mitigation and buffering can be provided. Conversely, discourage new uses likely to produce high levels of noise from locating in areas where noise-sensitive uses would be adversely impacted.

Action EH-7.5.A: Conditions of Approval
When approving development or issuing conditional use permits, establish conditions of approval (including construction hours and operating hours) that minimize the potential for noise impacts on nearby properties.

Policy EH-7.6: **Minimizing Noise in New Housing Areas.** In the event that new housing is constructed in areas that exceed normally acceptable noise levels, require project design and construction measures that minimize noise intrusion.

Policy EH-7.7 **Noise Reduction Measures.** Encourage local businesses to reduce noise impacts on the community by replacing excessively noisy equipment and machinery, applying noise-reduction technology, and following operating procedures that limit the potential for conflicts.

Policy EH-7.8 **Responding to Noise Problems.** Continue to respond promptly and effectively to local noise complaints and noise problems, enforcing City codes and ordinances as necessary to ensure that a peaceful environment is maintained.

Policy EH-7.9 **Vibration Impacts.** Limit the potential for vibration impacts from construction and ongoing operations to disturb sensitive uses such as housing and schools.

Action EH-7.9.A: Vibration Impacts.
Adopt Standard Conditions of Approval or Construction Development Standards to reduce the potential for vibration-related construction impacts for development projects near sensitive uses. Vibration impacts shall be considered as part of the project-level environmental evaluation and approval process for individual development proposals. [2]

[2] *The City intends to adopt a Standard Condition of Approval for new non-residential land uses that are subject to CEQA and require the use of large construction equipment (e.g., vibratory roller, pile drivers) within 50 feet of sensitive receptors (e.g., residential dwelling, classroom): The Condition would stipulate that future proposed projects shall use the best available technology for construction equipment and permanent operations so that vibrations are reduced to a level consistent with FTA guidelines for annoyance and architectural damage. Methods to reduce construction-related vibration include the use of smaller and well-maintained equipment, use of static rollers instead of vibratory of rollers, drilling of piles as opposed to pile driving, limitations on construction hours, and guidelines for the positioning of vibration-generating equipment.*

TRANSPORTATION NOISE

GOAL EH-8 **Reduce the effects of surface transportation noise, including vehicular noise and noise associated with railroad and BART traffic.**

Policy EH-8.1 **Transit Vehicle Noise.** Encourage BART and AC Transit to develop and apply noise-reduction technologies that reduce the noise impacts associated with BART trains and bus traffic.

Action EH-8.1.A: Lobbying for Quieter Public Transit Systems
Maintain regular contact with local representatives on the AC Transit and BART Boards to lobby for measures that reduce noise generated by transit vehicles. Strongly urge AC Transit and BART to apply state-of-the art technology to achieve quieter operations.

Policy EH-8.2 **Street and Highway Noise.** Where feasible and appropriate, develop and implement noise reduction measures when undertaking improvements, extensions, or design changes to San Leandro streets.

Action EH-8.2.A: California Vehicle Code Enforcement
Enforce the applicable sections of the California Vehicle Code pertaining to noise emissions, and enforce applicable traffic laws pertaining to speeding, racing, and screeching cars.

Action EH-8.2.B: Overnight Truck Parking
Enforce restrictions on overnight truck parking to minimize noise problems associated with idling trucks near residential areas.

Policy EH-8.3 **Site Planning and Building Design.** Require new development or redevelopment near freeways, arterials, BART, and major bus routes to incorporate site planning and architectural design measures that reduce the exposure of future building occupants to traffic noise.

Policy EH-8.4 **State and Federal Legislation.** Support state and federal legislation aimed at reducing transportation noise.

Policy EH-8.5 **Train Noise.** Work with the appropriate parties and agencies to reduce or mitigate the noise and vibration from trains traveling through San Leandro.

Action EH-8.5.A: Train Horns
Continue to work with federal and state agencies and authorities from the Union Pacific Railroad to pursue effective relief from freight train noise, including train horns and noise from the trains themselves.

Policy EH-8.6 **Freeway Noise.** Work with local transportation agencies, including Caltrans and the Alameda County Transportation Commission, to mitigate noise from Interstates 880, 580, and 238. Encourage these agencies to pursue a variety of measures, such as landscaping, berms, pavement changes, and sound walls to reduce the noise impacts of local freeways.

Action EH-8.6.A: I-580 Sound Walls
Maintain processes through which neighborhoods may petition for sound walls to reduce noise impacts from adjacent transportation facilities. Pending proposals include eastbound Interstate 580 between 108th Street and MacArthur/Dutton.

Policy EH-8.7 **Sound Wall Design.** Where sound walls are used, encourage aesthetically pleasing and innovative designs and require citizen input in the siting and design process. Require future sound wall engineering and acoustical design studies to address and mitigate the potential for displacement of sound from impacted properties to other properties further away from the noise source. .

AIRPORT IMPACTS

Goal EH-9 **Minimize the local impacts and hazards created by air traffic, ground operations, and all other aviation activities, particularly those associated with Oakland International Airport.**

Policy EH-9.1 **Monitoring of Airport Plans.** Actively participate in forums and discussions regarding operations and expansion plans for Oakland International Airport. Seek local representation on task forces, commissions, and advisory boards established to guide airport policies and programs.

Action EH-9.1.A: Participation in Airport Community Noise Management Forum
Supplement the City's participation in the Airport-Community Noise Management Forum through local Airport task forces and other airport-based advisory groups. The mission of such groups should be to monitor Airport plans and programs and advocate on behalf of residents and businesses impacted by Airport operations and expansion plans. Noise Management Forum activities should include discussions with the FAA to address and resolve air traffic impacts associated with implementation of the Metroplex air traffic system.

Policy EH-9.2 **Mitigation of Airport Noise.** Pursue mitigation of airport noise impacts to the fullest extent possible. Support and advocate for operational practices, changes to aircraft, new technologies, and physical improvements that would reduce the number of properties in San Leandro that are impacted by noise.

Action EH-9.2.A: Settlement Agreement Implementation
Continue implementation of the 2000 Settlement Agreement between the City of San Leandro and the Port of Oakland, as amended through 2017, to support noise insulation for additional San Leandro residences.

Policy EH-9.3 **Changes to Airport Operations.** Ensure that any changes to airport operations that would potentially result in higher noise levels in San Leandro incorporate comprehensive noise mitigation measures, even when the impacts will be of limited duration. To the greatest extent feasible, any changes in airport activity should avoid impacts to noise sensitive uses such as residential areas and schools.

Policy EH-9.4 **Comprehensive Noise Abatement.** Advocate for noise abatement and mitigation programs that are based not only on the airport's noise contour maps, but that consider other factors such as the frequency of overflights, the altitude of aircraft, and the hours of operation.

Policy EH-9.5 **Use of North Field.** Strongly discourage any long-range plans that would extend the runways at the North Field (27 L/R and 9 L/R), or increase the use of the North Field for cargo jets or commercial passenger airlines, except as required for emergencies and periodic maintenance procedures.

Policy EH-9.6 **Airport Safety Zones.** Regulate land uses within designated airport safety zones, height referral areas, and noise compatibility zones to minimize the possibility of future noise conflicts and accident hazards.

Policy EH-9.7 **Legislative Changes to Improve Mitigation.** Pursue legislative changes that provide San Leandro and other cities with greater leverage regarding the mitigation of noise impacts, air pollution impacts, and other off-site impacts resulting from aviation.

Action EH-9.7.A: Local Representation on Airport Issues
Lobby for regional representation or other forms of municipal input on the Port of Oakland Commission so that the impacts of Port operations on adjacent cities can be more comprehensively addressed.

Action EH-9.7.B: Relocation of the Noise Impact Boundary
Support federal legislation that would relocate the Noise Impact Boundary from the 65 dB to the 55 dB CNEL contour. In the event this change is made, evaluate the need for additional measures that would reduce noise impacts to homes located in the 55 dB CNEL or louder range.

Policy EH-9.8 **Monitoring Programs.** Promote ongoing monitoring of noise levels associated with airport operations and support expanded monitoring of other off-site impacts, such as air quality. Advocate for additional study of the health effects of airport noise and emissions, and use the findings of such research in defining the City's position on airport related issues.

Action EH-9.8.A: Expansion of the Noise Compatibility Program
Continue to work with the Port of Oakland on implementing the Noise Compatibility Program for the airport, including advocating for quieter aircraft, mitigating night-time engine run-up activities, and the monitoring of noise levels at additional locations in and around San Leandro.

Policy EH-9.9 **Aviation Accidents.** Maintain a high degree of readiness to respond to aircraft accidents. Continue to participate in preparedness drills and mutual aid activities with the City of Oakland to ensure quick and effective response to emergencies.

Action EH-9.9.A: Water Rescue Operations
Work collaboratively with the Port of Oakland and the Alameda County Fire Department to identify and maintain an appropriate location for emergency response to water rescue operations, in the event the San Leandro Shoreline can no longer serve this function.

ARTICLE 11. NOISE

4-1-1100 SHORT TITLE.

This Article shall be known and may be cited as the "Noise Ordinance."

4-1-1105 POLICY AND PURPOSE.

It is hereby declared to be the policy of the City of San Leandro, in the exercise of its police power, to protect the peace, health, safety and general welfare of the citizens of San Leandro from excessive, unnecessary and unreasonable noises from any and all sources in the community. It is the intention of the City Council to control the adverse effect of such noise sources on the citizens by prescribing standards prohibiting detrimental levels of noise and by providing a remedy for violations. The provisions of this Article and the remedies contained in this Code shall be cumulative and are not intended to replace any otherwise available remedies for public or private nuisances, nor any other civil or criminal remedies otherwise available. In addition, the regulations contained herein are not intended to substitute for any noise analysis conducted as a part of the City's environmental review process for discretionary permit approvals, nor is it intended to limit more strict noise control requirements for discretionary permit approvals should more strict measures be found to be necessary in order to maintain noise levels that are not detrimental to the health and welfare of the citizens of the City.

Among the unacceptable noise sources identified in the City's General Plan are mobile sources such as airplanes, commuter and freight railroads, and highway traffic and other sources which are regulated exclusively by the Federal or the State Government. While in most instances the City may not intervene to address these problems directly, it is the strong policy of the city to work with responsible government agencies and elected officials to reduce the real and damaging effects of these noise-producing activities on the quality of life of the City's residents.

4-1-1110 GENERAL PROHIBITION.

It is unlawful for any person, as defined in Section 1-14-100(h) of this Code, to make, continue, or cause to be made or continued any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. The factors which should be considered in determining whether a violation of this section exists include the following:

1. The sound level of the objectionable noise.
2. The sound level of the ambient noise.
3. The proximity of the noise to residential property.
4. The zoning of the area.
5. The population density of the area.
6. The time of day or night.
7. The duration of the noise.
8. Whether the noise is recurrent, intermittent, or constant.
9. Whether the noise is produced by an industrial, commercial, or noncommercial activity.
10. Whether the nature of the noise is usual or unusual.

4-1-1115 PROHIBITED ACTS.

It is the intent of this Article to prohibit all disturbing, excessive and offensive noises except those specifically exempted by Section 4-1-1120 and those permitted under an exception permit issued pursuant to Section 4-1-1125. Notwithstanding any other provisions of this Article, the following acts, which are not in any way exclusive, are declared to be disturbing, excessive and offensive noises in violation of Section 4-1-1110:

(a) **Noises by Animals.** The permitting, by any person having charge, care, custody, or control of any animal, of such animal to emit any noise which is disturbing, excessive or offensive. For the purposes of this subsection, the animal noise shall not be deemed a disturbance if a person is trespassing or threatening to trespass upon private property in or upon which the animal is situated or if the noise is for any other legitimate cause, such as someone teasing or provoking the animal. The scope of this subsection is intended to be and shall be interpreted to be broader than any similar prohibition set forth in Section 4-11-435 of this Title.

(b) **Construction-related Noise Near Residential Uses.** Construction work or related activity which is adjacent to or across a street or right-of-way from a residential use, except between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, or between 8:00 a.m. and 7:00 p.m. on Sunday and Saturday. No such construction is permitted on Federal holidays. As used in this Article, “construction” shall mean any site preparation, assembly, erection, substantial repair, alteration, demolition or similar action, for or on any private property, public or private right-of-way, streets, structures, utilities, facilities, or other similar property. Construction activities carried on in violation of this Article may be enforced as provided in Section 4-11-1130, and may also be enforced by issuance of a stop work order and/or revocation of any or all permits issued for such construction activity.

(c) **Conflicts with Residential Uses.** Subject to the restrictions on constructions contained in subdivision (b), the sustained operation or use between the hours of 9:00 p.m. and 8:00 a.m. of any electric or gasoline powered motor or engine or the repair, modification, reconstruction, testing or operation of any automobile, motorcycle, sweeper, vacuum, public address system, whistle muffler, motorized scooter, machine or mechanical device or other contrivance or facility unless such motor, engine, automobile, motorcycle, sweeper, vacuum, public address system, whistle muffler, motorized scooter, machine or mechanical device is enclosed within a sound insulated structure so as to prevent noise and sound from being plainly audible from any residential property line.

(d) **Loud Music in Parks.** The use of electronic equipment, including but not limited to amplifiers, radio loudspeakers, phonographs, tape amplifiers, electronically operated or acoustic musical instruments or other device of like design used for producing sound in or upon any public street, park or grounds, or any other open area to which the public has access, whether publicly or privately owned, between the hours of 10:00 p.m. and 9:00 a.m. is unlawful. At any other time of day, such equipment may not be used in a manner which disturbs the peace, quiet and comfort of neighboring residents or persons of normal sensitivity who are using such areas. This subsection shall not apply to events for which a permit has been obtained pursuant to Chapter 4-20.

(e) **Music, Stereos and Electronics.**

(1) Operating, playing or permitting the operation or playing of any radio, television set, audio equipment, drum, musical instrument, or similar device which produces or reproduces sound at any time of day in such a manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity. The operation of any such instrument, audio equipment, television set, machine or similar device between the hours of 10:00 p.m. and 8:00 a.m. in such manner as to be plainly audible at a distance of fifty (50) feet from the building, structure or vehicle in which it is located, shall be prima facie evidence of a violation of this subsection.

(2) The conducting of or carrying on of band or orchestral concerts, rehearsals or practice between the hours of 10:00 p.m. and 8:00 a.m. sufficiently loud as to disturb the peace, quiet or repose of persons of ordinary and normal sensitivity who reside in the immediate vicinity of such band or orchestral concerts or rehearsals or practice.

(3) Using, or operating, or permitting to be used or operated, for any purpose, any loud speaker, loudspeaker system, public address or similar device between the hours of 10:00 p.m. and 8:00 a.m. in such a manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity, except for any noncommercial

public speaking, public assembly or other activity for which a permit has been issued pursuant Chapter 4-20 of this Title.

4-1-1120 EXEMPTIONS.

The following activities shall be exempt from the provisions of this Title:

(a) **Emergency Work.** The provisions of this title shall not apply to the emission of sound for the purpose of alerting persons to the existence of an emergency or in the performance of emergency work, and activities involving the execution of the duties of duly authorized governmental personnel and others providing emergency response to the general public, including, but not limited to, sworn peace officers, emergency personnel, utility personnel, and the operation of emergency response vehicles and equipment.

(b) **Entertainment Events.** The provisions of this Article shall not apply to those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events and occasional public and private outdoor or indoor gatherings, public dances, shows, bands, sporting and entertainment events conducted between the hours of 7:00 a.m. and 10:00 p.m., and special events for which a permit has been issued pursuant to Chapter 4-20 of this Title.

(c) **Federal or State Preempted Activities.** The provisions of this Article shall not apply to any other activity the noise level of which is regulated by State or Federal law.

(d) **Maintenance to Residential Property.** The provisions of this Article shall not apply to noise sources associated with maintenance to property used for residential purposes, provided the activities take place between the hours of 8:00 a.m. and 10:00 p.m.

(e) **Public Health, Welfare and Safety Activities.** The provisions of this Article shall not apply to construction maintenance and repair operations conducted by public agencies, franchisees of the City and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public and to protect the public health, welfare and safety, including, but not limited to, trash collection, street sweeping, tree removal, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, sidewalks, etc.

4-1-1125 EXCEPTIONS.

If an applicant can show to the City Manager or his/her designee that a diligent investigation of available noise abatement techniques indicates that immediate compliance with the requirements of this Article would be impractical or unreasonable, a permit to allow exception from the provisions contained in all or a portion of this chapter may be issued, with appropriate conditions to minimize the public detriment caused by such exceptions. Any such permit shall be of as short duration as possible up to six months, but renewable upon a showing of good cause, and shall be conditioned by a schedule for compliance and details of methods therefor in appropriate cases. Any person aggrieved with the decision of the City Manager or his/her designee may appeal to the City Council pursuant to Article 4 of Chapter 1-12 of this Code.

4-1-1130 ENFORCEMENT.

Any violations of the provisions of this Article are expressly deemed and declared to be a public nuisance, and such violation shall be abated in the manner provided in Chapter 1-12 of this Code.

(Legislative History: Ordinance No. 2003-005, 3/17/03 (Sections 4-1-1100—4-1-1130); Ordinance No. 2011-006, 4/4/11 (Section 4-1-1125))

AMBIENT NOISE MONITORING RESULTS

To determine baseline noise levels in the project vicinity, ambient noise monitoring was conducted by PlaceWorks in February 2021. Measurements were made during weekday peak commute periods. Two long-term (24 hour) measurements and four short-term (10 minute) measurements were conducted within the project vicinity. All measurements were conducted between Monday, February 8 and Tuesday, February 9, 2021.

The primary noise source observed was traffic. Meteorological conditions during the measurement periods were favorable for outdoor sound measurements and were noted to be representative of the typical conditions for the season. All sound level meters used for noise monitoring satisfy the American National Standards Institute (ANSI) standard for Type 1 instrumentation.[1] The sound level meters were set to "slow" response and "A" weighting (dBA). The meters were calibrated prior to and after the monitoring period. All measurements were at least five feet above the ground and away from reflective surfaces. Noise measurement locations are described below and shown in Figure Noise-1. A graphic summary of the daily trend during long-term noise measurements are provided after at the end of this section. The short-term noise measurement results are summarized in Table Noise-1.

TABLE NOISE-1 SHORT-TERM NOISE MEASUREMENTS SUMMARY IN A-WEIGHTED SOUND LEVELS

Monitoring Location	Description	10-Minute Noise Level, dBA		
		L_{min}	L_{eq}	L_{max}
ST-1	Southern project boundary, Callan Avenue – 3:24 p.m., 2/8/2021	49.1	65.3	77.6
ST-2	Root Park – 3:52 p.m., 2/9/2021	52.9	67.9	80.7
ST-3	56 Chumalia Street multi-family residential – 4:07 p.m., 2/9/2021	45.5	56.5	69.9
ST-4	1144 Hyde Street multi-family residential – 3:41 p.m., 2/8/2021	44.7	53.7	64.5

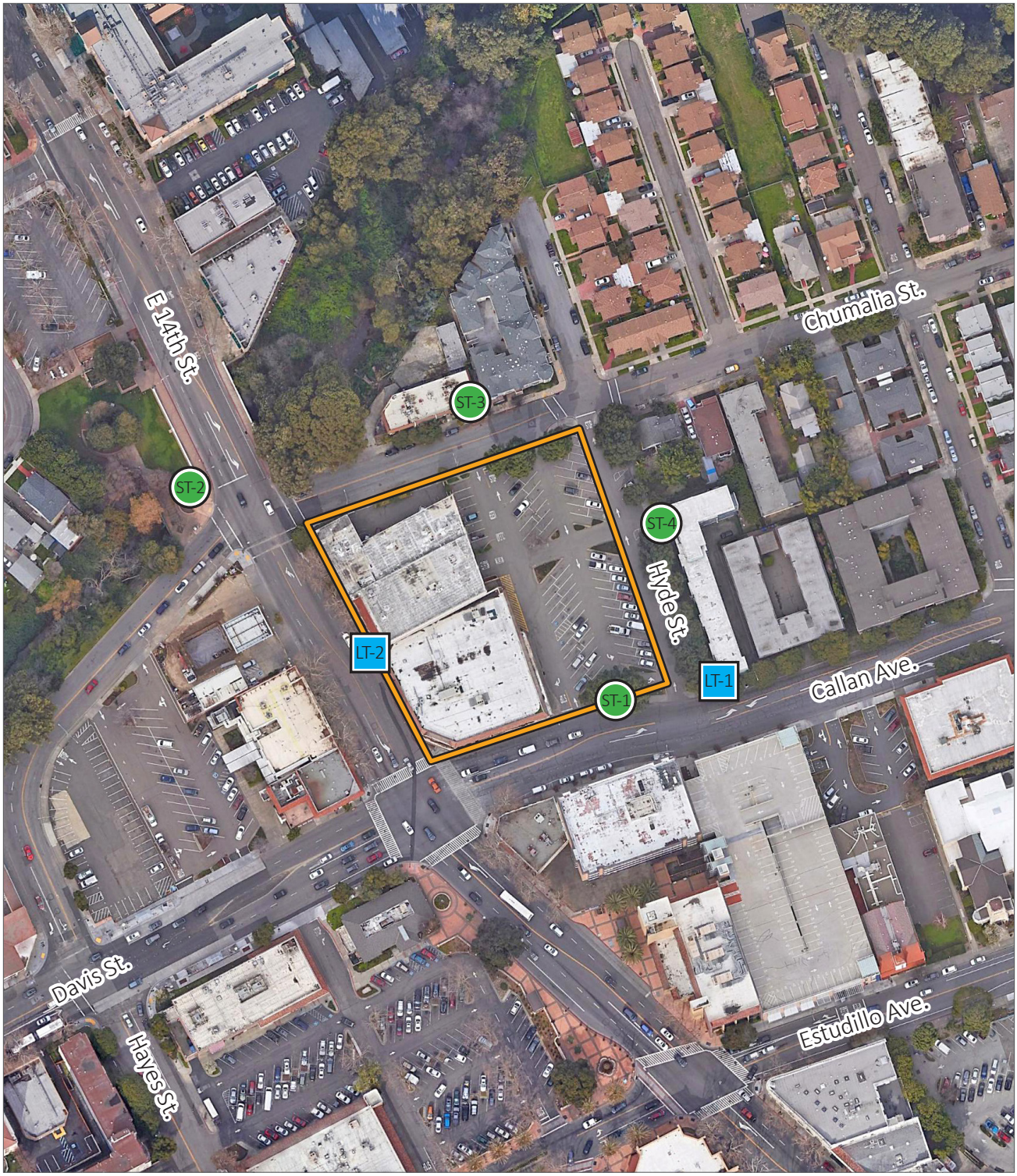
Source: PlaceWorks 2021

The following describes the noise monitoring locations:

- **Long-Term Location 1 (LT-1)** was near the corner of Callan Avenue and Hyde Street. A 24-hour noise measurement was conducted, beginning at the 4:00 p.m. hour on Monday, February 8, 2021. The noise environment of this site is characterized primarily by local traffic on Callan Avenue and the measured CNEL was 73 dBA.
- **Long-Term Location 1 (LT-2)** was along E. 14th Street neat the western project boundary. A 24-hour noise measurement was conducted, beginning at the 4:00 p.m. hour on Monday, February 8, 2021. The noise environment of this site is characterized primarily by local traffic on E. 14th Street and the measured CNEL was 74 dBA.
- **Short-Term Location 1 (ST-1)** was along Callan Avenue near the southern project boundary. A 10-minute noise measurement was conducted at 3:24 p.m on Monday, February 8, 2021. The noise environment of this site is characterized primarily by traffic on Callan Avenue.

[1] Ambient noise monitoring was performed using Larson-Davis Model LxT and 820 sound level meters.

- Short-Term Location 2 (ST-2) was at a park bench in Root Park. A 10-minute noise measurement was conducted at 3:52 p.m. on Tuesday, February 9, 2021. The noise environment of this site is characterized primarily by traffic on E. 14th Street.
- Short-Term Location 3 (ST-3) was in front of 56 Chumalia Street multi-family residences. A 10-minute noise measurement was conducted at 4:07 p.m. on Tuesday, February 9, 2021. The noise environment of this site is characterized primarily by distant traffic noise on E. 14th Street and Callan Avenue. Local traffic on Chumalia Street was minimal. Secondary noise sources such as distant BART pass-bys and occasional aircraft flyovers also contributed to the noise environment at this location.
- Short-Term Location 4 (ST-4) was in front of 1144 Hyde Street multi-family residences. A 10-minute noise measurement was conducted at 3:41 p.m. on Monday, February 8, 2021. The noise environment of this site is characterized primarily by distant traffic noise on Callan Avenue. Local traffic on Hyde Street and parking lot activity at the project site were minimal. Secondary noise sources such as distant BART pass-bys and occasional aircraft flyovers also contributed to the noise environment at this location.



Source: Google Earth, 2021. PlaceWorks.com, 2021.

0 200
Scale (Feet)

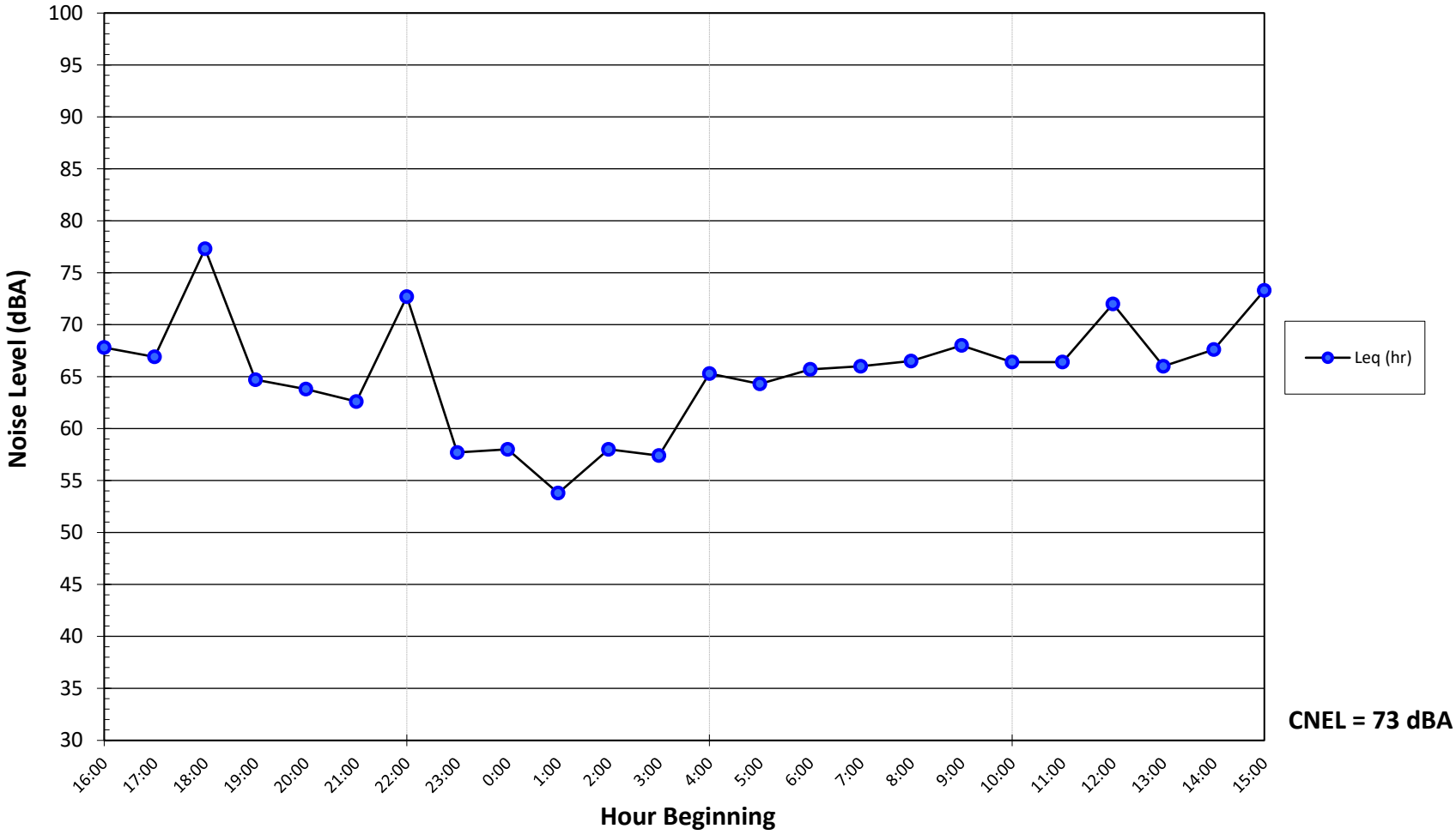
Project Boundary

ST = Short-term Measurement Location

LT = Long-term Measurement Location

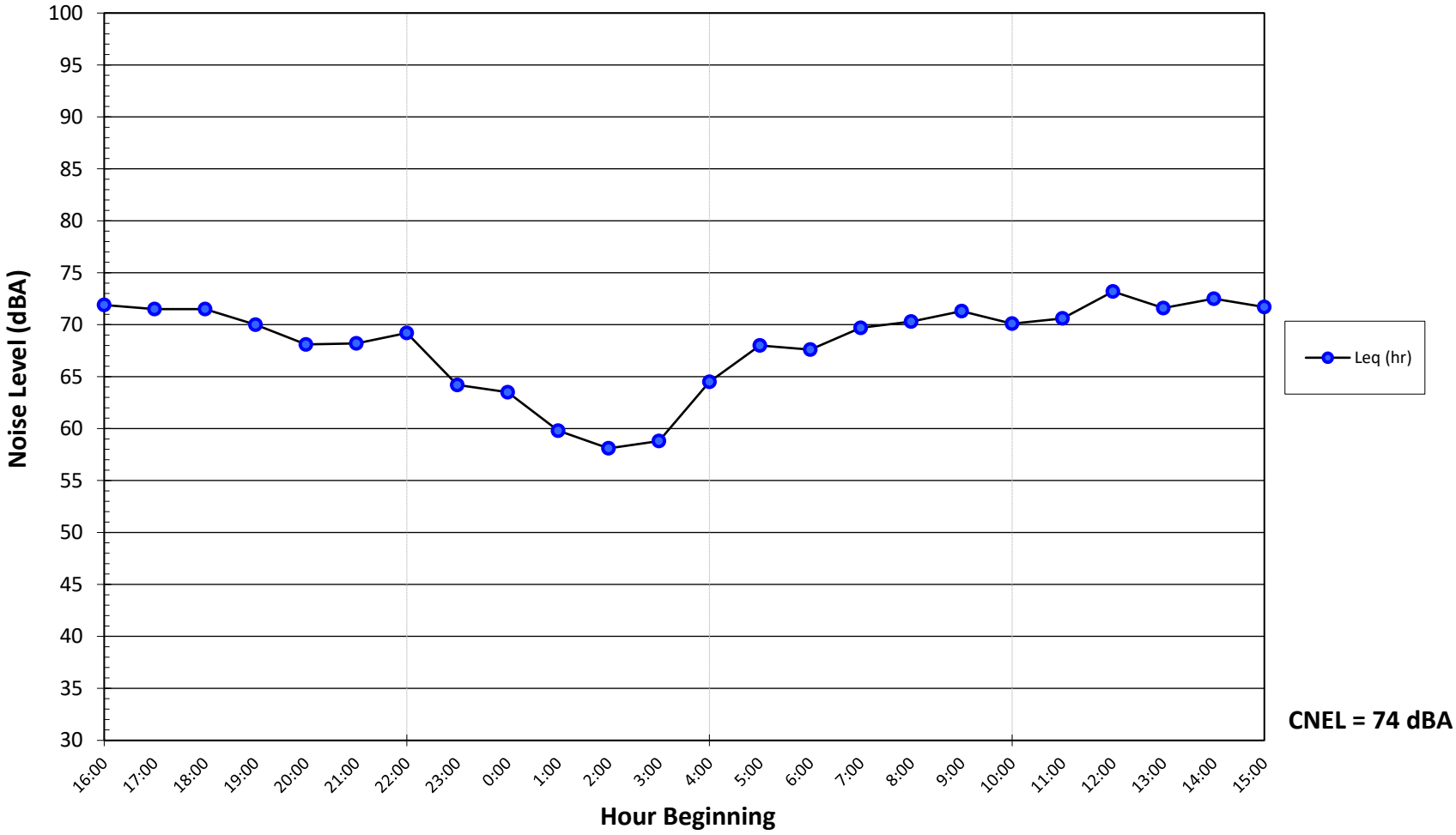
Figure Noise-1
Approximate Noise Monitoring Locations

Noise Levels at LT-1
Callan Avenue, San Leandro, CA
Monday, February 8 through Tuesday, February 9, 2021



CNEL = 73 dBA

Noise Levels at LT-2
E. 14th Street, San Leandro, CA
Monday, February 8 through Tuesday, February 9, 2021



CNEL = 74 dBA

TRAFFIC NOISE INCREASE CALCULATIONS

1188 East 14th Street Project TIS - Traffic Volume Tables

Existing Conditions

Existing Conditions AM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	45	214	142	36	434	47	318	403	35	38	356	28
2. Estudillo Avenue at East 14th Street (Signalized)	27	99	12	160	52	243	35	483	107	91	383	49
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	108	1	5	8	18	39	19	476	6	10	416	338
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	66	392	36	10	750	2	115	46	28	2	62	318
5. Bancroft Avenue at Callan Avenue (Signalized)	138	14	127	30	7	21	289	379	33	37	399	185
Existing Conditions PM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	83	468	216	35	316	30	212	469	38	49	469	39
2. Estudillo Avenue at East 14th Street (Signalized)	92	163	34	132	134	142	48	468	124	184	428	89
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	109	72	72	9	52	225	30	537	2	19	522	237
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	174	755	109	28	518	2	99	68	71	6	50	223
5. Bancroft Avenue at Callan Avenue	244	11	213	26	16	26	143	483	34	24	399	165

Existing plus Approved Projects (Baseline) Conditions

Baseline AM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	48	214	142	36	434	47	318	403	35	38	356	29
2. Estudillo Avenue at East 14th Street (Signalized)	27	99	12	160	52	243	35	483	107	91	383	49
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	108	1	5	8	18	39	19	479	6	10	417	338
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	66	395	36	10	751	2	115	46	28	2	62	318
5. Bancroft Avenue at Callan Avenue (Signalized)	138	14	127	30	7	21	289	379	33	37	399	185
Baseline PM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	84	468	216	35	316	30	212	469	38	49	469	42
2. Estudillo Avenue at East 14th Street (Signalized)	92	163	34	132	134	142	48	468	124	184	428	89
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	109	72	72	9	52	225	30	538	2	19	525	237
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	174	756	109	28	521	2	99	68	71	6	50	223
5. Bancroft Avenue at Callan Avenue	244	11	213	26	16	26	143	483	34	24	399	165

Baseline plus Project Conditions

Baseline AM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	57	250	142	62	479	47	318	408	54	38	361	41
2. Estudillo Avenue at East 14th Street (Signalized)	27	99	12	160	52	254	35	496	107	105	400	49
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	108	1	5	29	18	61	19	474	25	27	413	338
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	66	440	36	10	808	2	115	46	28	2	62	318
5. Bancroft Avenue at Callan Avenue (Signalized)	145	14	134	30	7	21	295	379	33	37	399	191
Baseline PM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	93	502	216	48	342	30	212	474	57	49	473	48
2. Estudillo Avenue at East 14th Street (Signalized)	92	163	34	132	134	153	48	481	124	192	437	89
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	109	72	72	47	52	264	30	508	46	60	497	237
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	174	799	109	28	553	2	99	68	71	6	50	223
5. Bancroft Avenue at Callan Avenue	248	11	217	26	16	26	148	483	34	24	399	170

Cumulative Conditions (without Project)

Cumulative Conditions AM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	50	220	200	35	492	58	871	675	56	42	474	28
2. Estudillo Avenue at East 14th Street (Signalized)	99	111	20	171	58	269	37	1,203	114	110	505	67
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	154	2	21	29	18	63	30	762	33	34	543	340
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	80	433	44	19	1,395	4	115	46	28	2	62	318
5. Bancroft Avenue at Callan Avenue (Signalized)	178	16	162	30	7	21	290	623	45	42	451	203
Cumulative Conditions PM												
Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	110	559	802	41	326	31	313	686	37	70	669	50
2. Estudillo Avenue at East 14th Street (Signalized)	186	205	53	164	167	308	55	523	142	384	902	189
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	109	72	72	4	52	219	44	811	-10	9	790	278
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	186	1,418	117	35	609	2	99	68	111	7	57	253
5. Bancroft Avenue at Callan Avenue	287	13	250	26	16	26	143	675	44	30	503	203

Cumulative Conditions (with Project)

Intersection	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	59	256	200	61	537	58	871	680	75	42	479	40
2. Estudillo Avenue at East 14th Street (Signalized)	99	111	20	171	58	280	37	1,216	114	124	522	67
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	154	2	21	50	18	85	30	757	52	51	539	340
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	80	478	44	19	1,452	4	115	46	28	2	62	318
5. Bancroft Avenue at Callan Avenue (Signalized)	185	16	169	30	7	21	296	623	45	42	451	209

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	119	593	802	54	352	31	313	691	56	70	673	56
2. Estudillo Avenue at East 14th Street (Signalized)	186	205	53	164	167	319	55	536	142	392	911	189
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	109	72	72	42	52	258	44	781	34	50	762	278
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	186	1,461	117	35	641	2	99	68	111	7	57	253
5. Bancroft Avenue at Callan Avenue	291	13	254	26	16	26	148	675	44	30	503	208

Existing

Intersection		PM Peak																
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West	Sum
East 14th Street	Davis/Callan Avenue	212	469	38	49	469	39	83	468	216	35	316	30	1139	1439	936	1334	
East 14th Street	Estudillo Avenue	48	468	124	184	428	89	92	163	34	132	134	142	1403	1234	879	560	
East 14th Street	Chumulia Street	30	537	2	19	522	237	109	72	72	9	52	225	1649	1172	379	572	
Hays Street	Davis/Callan Avenue	99	68	71	6	50	223	174	755	109	28	518	2	523	425	1380	1878	
Bancroft Avenue	Callan Avenue	143	483	34	24	399	165	244	11	213	26	16	26	1341	1298	137	792	
																		20470

Intersection		AM Peak																
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West	Sum
East 14th Street	Davis/Callan Avenue	318	403	35	38	356	28	45	214	142	36	434	47	917	1290	804	1181	
East 14th Street	Estudillo Avenue	35	483	107	91	383	49	27	99	12	160	52	243	1276	1180	752	274	
East 14th Street	Chumulia Street	19	476	6	10	416	338	108	1	5	8	18	39	1387	930	82	489	
Hays Street	Davis/Callan Avenue	115	46	28	2	62	318	66	392	36	10	750	2	496	297	1184	1677	
Bancroft Avenue	Callan Avenue	289	379	33	37	399	185	138	14	127	30	7	21	1159	1257	142	760	
														0	0	0	0	**17534**

Baseline Plus Project

Intersection		PM Peak															
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West	Sum
East 14th Street	Davis/Callan Avenue	212	474	57	49	473	48	93	502	216	48	342	30	1167	1480	1028	1413	
East 14th Street	Estudillo Avenue	48	481	124	192	437	89	92	163	34	132	134	153	1444	1256	898	560	
East 14th Street	Chumulia Street	30	508	46	60	497	237	109	72	72	47	52	264	1675	1200	541	572	
Hays Street	Davis/Callan Avenue	99	68	71	6	50	223	174	799	109	28	553	2	523	425	1459	1957	
Bancroft Avenue	Callan Avenue	148	483	34	24	399	170	248	11	217	26	16	26	1350	1307	137	810	
																		21202

Intersection		AM Peak															
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**					
East 14th Street	Davis/Callan Avenue	318	408	54	38	361	41	57	250	142	62	479	47	952	1345	930	1287	
East 14th Street	Estudillo Avenue	35	496	107	105	400	49	27	99	12	160	52	254	1331	1210	777	274	
East 14th Street	Chumulia Street	19	474	25	27	413	338	108	1	5	29	18	61	1421	965	161	489	
Hays Street	Davis/Callan Avenue	115	46	28	2	62	318	66	440	36	10	808	2	496	297	1290	1783	
Bancroft Avenue	Callan Avenue	295	379	33	37	399	191	145	14	134	30	7	21	1172	1270	142	786	
																		18378

Cumulative without Project

Intersection		PM Peak															
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West	Sum
East 14th Street	Davis/Callan Avenue	313	686	37	70	669	50	110	559	802	41	326	31	1617	2548	1064	2159	
East 14th Street	Estudillo Avenue	55	523	142	384	902	189	186	205	53	164	167	308	2491	1838	1370	855	
East 14th Street	Chumulia Street	44	811	-10	9	790	278	109	72	72	4	52	219	2216	1710	346	627	
Hays Street	Davis/Callan Avenue	99	68	111	7	57	253	186	1,418	117	35	609	2	573	487	2182	2682	
Bancroft Avenue	Callan Avenue	143	675	44	30	503	203	287	13	250	26	16	26	1724	1641	155	912	
																		29197

Intersection		AM Peak															
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**					
East 14th Street	Davis/Callan Avenue	871	675	56	42	474	28	50	220	200	35	492	58	1327	2311	903	1861	
East 14th Street	Estudillo Avenue	37	1,203	114	110	505	67	99	111	20	171	58	269	2253	2050	833	392	
East 14th Street	Chumulia Street	30	762	33	34	543	340	154	2	21	29	18	63	1896	1419	179	565	
Hays Street	Davis/Callan Avenue	115	46	28	2	62	318	80	433	44	19	1,395	4	511.9	314	1881	2385	
Bancroft Avenue	Callan Avenue	290	623	45	42	451	203	178	16	162	30	7	21	1518	1601	161	856	
																		25215

Cumulative with Project

Intersection		PM Peak																
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West	Sum
East 14th Street	Davis/Callan Avenue	313	691	56	70	673	56	119	593	802	54	352	31	1641	2589	1156	2234	
East 14th Street	Estudillo Avenue	55	536	142	392	911	189	186	205	53	164	167	319	2532	1860	1389	855	
East 14th Street	Chumulia Street	44	781	34	50	762	278	109	72	72	42	52	258	2238	1734	508	627	
Hays Street	Davis/Callan Avenue	99	68	111	7	57	253	186	1,461	117	35	641	2	573	487	2257	2757	
Bancroft Avenue	Callan Avenue	148	675	44	30	503	208	291	13	254	26	16	26	1733	1650	155	930	
																		29,905

Intersection		AM Peak															
Main Street	**Cross Street**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	North	South	East	West
East 14th Street	Davis/Callan Avenue	871	680	75	42	479	40	59	256	200	62	537	58.1	1358	2367	1030	1963
East 14th Street	Estudillo Avenue	37	1,216	114	124	522	67	99	111	20	171	58	280	2308	2080	858	392
East 14th Street	Chumulia Street	30	757	52	51	539	340	154	2	21	51	18	85	1926	1451	259	565
Hays Street	Davis/Callan Avenue	115	46	28	2	62	318	80	478	44	19	1,452	4	511.9	314	1983	2487
Bancroft Avenue	Callan Avenue	296	623	45	42	451	209	185	16	169	30	7	21	1531	1614	161	882
																	26,039

Traffic Noise Increase Table - PM Peak Hour Volumes

Segment	Existing No Project	Existing Plus Project	Future No Project	Future Plus Project	Project Noise Increase	Cumulative Increase	Project Cumulative Contribution
E 14th St - Callan Ave to Chumalia St	1139	1167	1617	1641	0.1	1.6	0.1
E 14th St - Callan Ave to Estudillo Ave	1439	1480	2548	2589	0.1	2.6	0.1
Davis/Callan Ave - East of E 14th St	936	1028	1064	1156	0.4	0.9	0.4
Callan Ave - E 14th St to Hays/Chumalia St	1334	1413	2159	2234	0.2	2.2	0.1
E 14th St - South of Estudillo Ave	1234	1256	1838	1860	0.1	1.8	0.1
Estudillo Ave - East of E 14th St	879	898	1370	1389	0.1	2.0	0.1
Estudillo Ave - West of E 14th St	560	560	855	855	0.0	1.8	0.0
E 14th St - North of Chumalia St	1649	1675	2216	2238	0.1	1.3	0.0
Chumalia St - East of E 14th St	379	541	346	508	1.5	1.3	1.7
Chumalia St - West of E 14th St	572	572	627	627	0.0	0.4	0.0
Hays St - North of Callan Ave	523	523	573	573	0.0	0.4	0.0
Hays St - South of Callan Ave	425	425	487	487	0.0	0.6	0.0
Callan Ave - West of Hays St	1878	1957	2682	2757	0.2	1.7	0.1
Bancroft Ave - North of Estudillo Ave	1341	1350	1724	1733	0.0	1.1	0.0
Bancroft Ave - South of Estudillo Ave	1298	1307	1641	1650	0.0	1.0	0.0
Estudillo Ave - East of Bancroft Ave	137	137	155	155	0.0	0.5	0.0
Estudillo Ave - West of Bancroft Ave	792	810	912	930	0.1	0.0	0.0