Noise Study Report

Reche Canyon Road Extension to Hunts Lane Project

City of Colton

District 8-Riverside

FERPL16 5065(028)

August 2024

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District 8-RIV-Reche Canyon Road

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Summary

Project Description

The Reche Canyon Road to Hunts Lane Extension Project (Proposed Project) would be located in the City of Colton along Reche Canyon Road from approximately the southern access gate of Montecito Memorial Park to the intersection of Washington Street and Hunts Lane. This approximately 0.3-mile (1,750 feet) section of Reche Canyon Road would be constructed within an existing dedicated right-of-way (ROW) and areas immediately adjacent to the ROW. Pedestrian and streetscape improvements would take place entirely in the existing public ROW; however, grading activities associated with the Proposed Project are required beyond the ROW.

Purpose of Report

The purpose of this Noise Study Report (NSR) is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise." 23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and Federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise standards.

The Proposed Project is a Type I project as defined in 23 CFR 772.5(h). The Proposed Project includes the construction of a new four-lane segment of Reche Canyon Road that would provide a direct connection to Hunts Lane. The Project is capacity increasing, would be constructed in a new location, would result in a substantial change in the vertical alignment, and adjacent to noise sensitive uses (Montecito Memorial Park and Mortuary). A noise analysis was conducted in accordance with FHWA and Caltrans guidelines to determine whether the Proposed Project noise levels would approach or exceed the Noise Abatement Criteria (NAC) or would substantially exceed existing noise levels (23 CFR 772).

Existing Environment

Land uses within the Project area were categorized by land use type, FHWA activity category (as defined in Table 4-1), and the anticipated frequency of human use. Accordingly, this noise impact analysis focuses on locations with defined outdoor activity areas of frequent human use. Based on Caltrans TeNS (2013) guidance, "Receptors that are located beyond 500 feet from the Project area do not need to be considered for analysis unless there is a reasonable expectation that noise impacts would extend beyond that boundary." Therefore, this noise study includes receptors within and close to the 500-foot buffer distance from the Project area and excludes those located at greater distances.

To assess the existing ambient noise conditions, two (2) long-term noise level measurements, and eleven (11) short-term ambient noise level measurements were collected during free flow traffic conditions. The noise level measurement locations were selected to describe and document the existing noise environment within the Project area. All of the noise level measurements were used to calibrate the noise prediction model with concurrent traffic counts and observed vehicle speeds.

Future Traffic Noise Conditions

A total of 23 representative receptor locations were modeled and evaluated for potential noise impacts resulting from traffic noise under Existing and Opening Year (2025) conditions based on traffic volumes obtained from the *Traffic Study Report for Reche Canyon Road Extension to Hunts Lane Project in the City of Colton* (KOA, September 7, 2021). According to 23 CFR 772.11, when traffic noise impacts have been identified, noise abatement measures must be considered. Traffic noise impacts result from one or more of the following occurrences: (1) an increase of 12 decibels (dB) or more over their corresponding existing noise levels, or (2) predicted noise levels approach or exceed the Noise Abatement Criteria (NAC).

As shown in this NSR, the future noise levels at the 23 receptor locations would not approach or exceed the NAC under Activity Categories F for Existing or Opening Year (2025) conditions. Moreover, no substantial noise increase of 12 dB or more over the corresponding existing noise level would result under Opening Year (2025) conditions.

Construction Noise Analysis

The closest sensitive receptors (i.e., residences) are located approximately 40 feet of the Project construction areas suggesting that there are receptor locations that may be subject to short-term roadway construction noise level impacts approaching 91 dBA L_{max}. Construction noise is regulated by Caltrans' Standard Specifications in Section 14-8.02,

"Noise Control". Section 14-8.02 states that "*Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m. Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.*" No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans Standard Specifications Section 14.8-02. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise.

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List of Abbreviated Terms

CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
dB	Decibels
FHWA	Federal Highway Administration
Hz	Hertz
kHz	Kilohertz
L_{dn}	Day-Night Level
L_{eq}	Equivalent Sound Level
$L_{eq(h)}$	Equivalent Sound Level over one hour
L_{max}	Maximum Sound Level
LOS	Level of Service
L_{xx}	Percentile-Exceeded Sound Level
mPa	micro-Pascals
mph	miles per hour
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NEPA	National Environmental Policy Act
NSR	Noise Study Report
Protocol	Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
SPL	sound pressure level
TeNS	Caltrans' Technical Noise Supplement
TNM 2.5	FHWA Traffic Noise Model Version 2.5

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Chapter 1. Introduction

The Proposed Project includes the construction of a new four-lane segment of Reche Canyon Road that would provide a direct connection to Hunts Lane. Elements of the infrastructure to be improved include sidewalks, curb and gutter, paving, curb extensions, median reconstruction, intersection lighting, storm water facilities, bike lanes, crosswalks, and landscaping. A portion of the existing Gage Canal structure would be removed just south of Washington Street as part of the Proposed Project; however, the Gage Canal structure no longer conveys water. The Proposed Project would require utility relocation.

1.1 Purpose of the Noise Study Report

The purpose of this NSR is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise." 23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and Federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise standards. Compliance with 23 CFR 772 provides compliance with the noise impact assessment requirements of the National Environmental Policy Act (NEPA).

The Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol) (Caltrans 2020) provides Caltrans policy for implementing 23 CFR 772 in California. The Protocol outlines the requirements for preparing noise study reports (NSR). Noise impacts associated with this project under the California Environmental Quality Act (CEQA) are evaluated separately in the Preliminary Environmental Study (PES) Form.

1.1. Project Purpose and Need

Reche Canyon Road provides regional access between the City of Moreno Valley in Riverside County to the south and cities within the San Bernardino valley in San Bernardino County as well as local access for residents in the City Colton. Reche Canyon Road is oriented in a north-south direction and is currently a two-lane roadway with an 88-foot ROW. Reche Canyon Road currently experiences high traffic volumes during peak hours, particularly from regional commuters. The Proposed Project would add additional capacity along Reche Canyon Road and provide a direct connection to areas within the San Bernardino valley via Hunts Lane.

The Proposed Project includes the construction of a new four-lane segment of Reche Canyon Road that would provide a direct connection to Hunts Lane. Elements of the infrastructure to be improved include sidewalks, curb and gutter, paving, curb extensions,

median reconstruction, intersection lighting, storm water facilities, bike lanes, crosswalks, and landscaping. A portion of the existing Gage Canal structure would be removed just south of Washington Street as part of the Proposed Project; however, the Gage Canal structure no longer conveys water. The Proposed Project would require utility relocation.

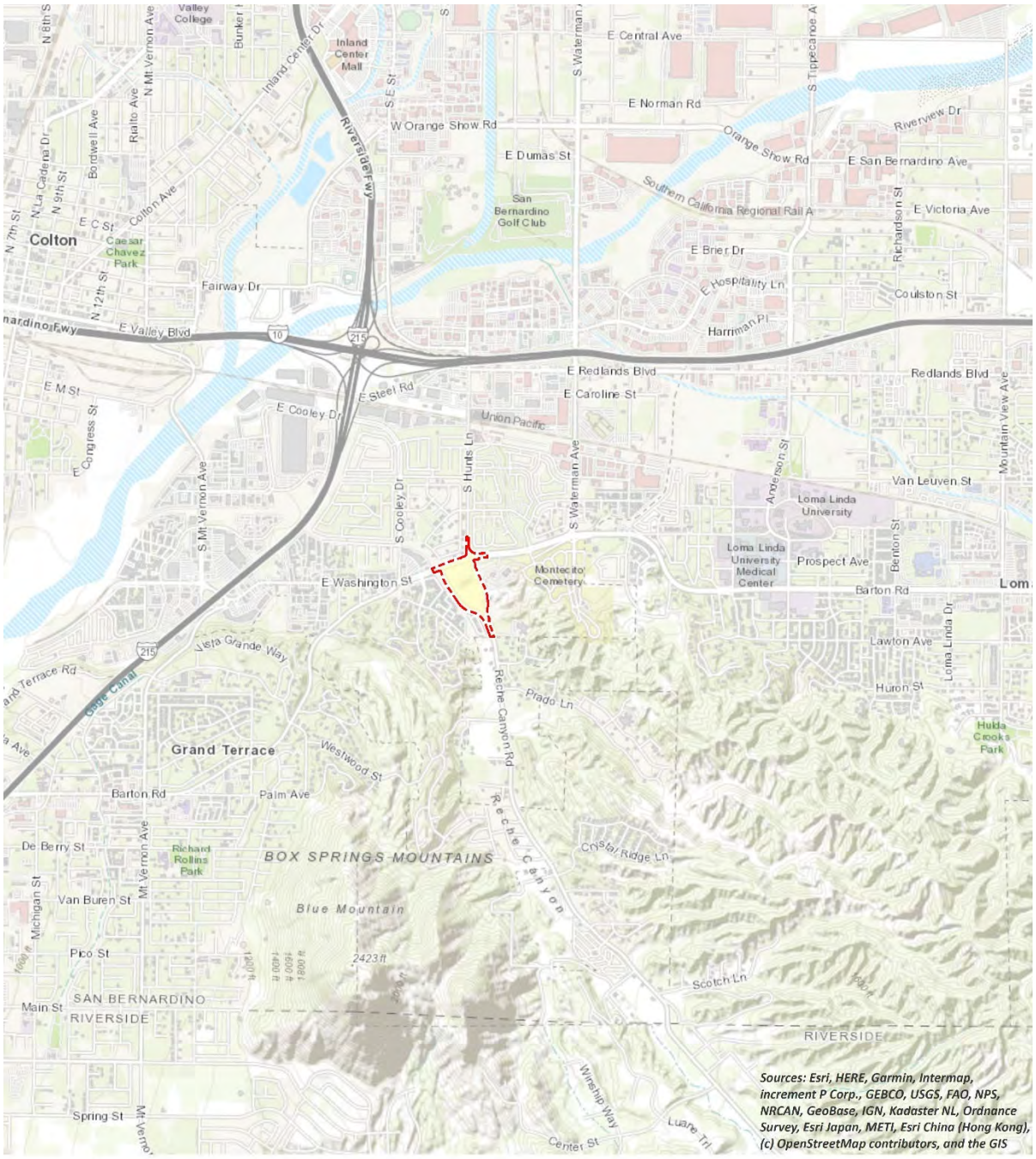
Chapter 2. Project Description

The Proposed Project consists of constructing a new roadway that will serve as an extension of Reche Canyon Road between its current alignment and Washington Street. The new roadway will consist of an approximately 1,500-foot-long road segment between Reche Canyon Road, adjacent to the Canyon Apartment Homes and the intersection of Hunts Lane & Washington Street. The proposed roadway will provide a roadway width of 72 feet within an 88-foot right-of-way. Two travel lanes and bicycle lanes will be provided in each direction, separated by a center two-way left-turn lane (TWLTL). At the north end of the proposed segment, the roadway will be built as the south leg of the Hunts Lane & Washington Street intersection, with a left-turn lane, a through lane, and a shared through-right lane proposed along the approach. In addition, signal and lane configuration improvements will be installed at this intersection as part of the Project, including a westbound left-turn lane along Washington Street. The raised median along the east and west legs of Washington Street will be reconfigured to accommodate changes to the lane configurations and lane widths. At the south end of the roadway, a new signalized intersection will be installed immediately south of the northern driveway to the Canyon Apartment Homes development. The proposed segment will form the westbound leg of this intersection and will feature a left-turn lane onto southbound Reche Canyon Road and a right-turn lane onto northbound Reche Canyon Road. The southbound Reche Canyon Road approach would be reconfigured to have a left-turn lane onto the new roadway and two trough lanes to continue southbound along Reche Canyon Road. The northbound approach of Reche Canyon Road would be restriped to accommodate a through lane for traffic continuing along Reche Canyon Road and a right-turn lane for vehicles turning onto the proposed road segment. The aerial photograph in Exhibit 1 shows the approximate Project location. The Proposed Project is projected to have a completion year 2025.

2.1. No-Build

Under the No-Build Alternative, no changes would be made to Reche Canyon Road in the Project area.

Figure 1: Project Location Map



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LEGEND:

Site Boundary

Chapter 3. Fundamentals of Traffic Noise

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS) (Caltrans 2013), a technical supplement to the Protocol that is available on Caltrans Web site (http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf).

3.1. Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

3.1. Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

3.2. Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

3.3. Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of

the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

3.4. A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 3-1 describes typical A-weighted noise levels for various noise sources.

Table 3-1. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 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		
Gas lawn mower, 100 feet	**— 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: Caltrans 2013.

3.5. Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

3.6. Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random.

Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (L_{eq}[h]) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

3.7. Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

3.7.1. Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

3.7.2. Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to

the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.

3.7.3. Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

3.7.4. Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

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Chapter 4. Federal Regulations and State Policies

This report focuses on the requirements of 23 CFR 772, as discussed below.

4.1. Federal Regulations

4.1.1. 23 CFR 772

23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and Federal-aid highway projects. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects.

- FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment of the highway. The following projects are also considered to be Type I projects:
- The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a high-occupancy vehicle (HOV) lane, high-occupancy toll (HOT) lane, bus lane, or truck climbing lane,
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane,
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange,
- Restriping existing pavement for the purpose of adding a through traffic lane or an auxiliary lane,
- The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.

If a project is determined to be a Type I project under this definition, the entire project area as defined in the environmental document is a Type I project.

A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

Under 23 CFR 772.11, noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR 772 requires that the project sponsor "consider" noise abatement before adoption of the final NEPA document. This process involves identification of noise abatement measures that are

reasonable, feasible, and likely to be incorporated into the project, and of noise impacts for which no apparent solution is available.

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design-year approaches or exceeds the NAC specified in 23 CFR 772, or a predicted noise level substantially exceeds the existing noise level (a "substantial" noise increase). 23 CFR 772 does not specifically define the terms "substantial increase" or "approach"; these criteria are defined in the Protocol, as described below.

Table 4-1 summarizes NAC corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual or permitted land use in a given area.

4.1.2. Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or Federal-aid highway projects. The Protocol defines a noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA or more. The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The Technical Noise Supplement to the Protocol provides detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

Table 4-1. Activity Categories and Noise Abatement Criteria (23 CFR 772)

Activity Category	Activity $L_{eq}[h]$[1]	Evaluation Location	Description of Activities
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67	Exterior	Residential.
C[2]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F			Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G			Undeveloped lands that are not permitted.

[1] The $L_{eq}(h)$ activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA).

[2] Includes undeveloped lands permitted for this activity category.

4.2. State Regulations and Policies

4.2.1. California Environmental Quality Act (CEQA)

Noise analysis under the California Environmental Quality Act (CEQA) may be required regardless of whether or not the project is a Type I project. The CEQA noise analysis is completely independent of the 23 CFR 772 analysis done for NEPA. Under CEQA, the baseline noise level is compared to the build noise level. The assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include: the uniqueness of the setting, the sensitive nature of the noise receivers, the magnitude of the noise increase, the number of residences affected, and the absolute noise level.

The significance of noise impacts under CEQA are addressed in the environmental document rather than the NSR. Even though the NSR (or noise technical memorandum) does not specifically evaluate the significance of noise impacts under CEQA, it must contain the technical information that is needed to make that determination in the environmental document.

4.2.2. Section 216 of the California Streets and Highways Code

Section 216 of the California Streets and Highways Code relates to the noise effects of a proposed freeway project on public and private elementary and secondary schools. Under this code, a noise impact occurs if, as a result of a proposed freeway project, noise levels exceed 52 dBA-L_{eq}(h) in the interior of public or private elementary or secondary classrooms, libraries, multipurpose rooms, or spaces. This requirement does not replace the "approach or exceed" NAC criterion for FHWA Activity Category E for classroom interiors, but it is a requirement that must be addressed in addition to the requirements of 23 CFR 772.

If a project results in a noise impact under this code, noise abatement must be provided to reduce classroom noise to a level that is at or below 52 dBA-L_{eq}(h). If the noise levels generated from freeway and roadway sources exceed 52 dBA-L_{eq}(h) prior to the construction of the proposed freeway project, then noise abatement must be provided to reduce the noise to the level that existed prior to construction of the project.

Chapter 5. Study Methods and Procedures

Methods for Identifying Land Uses and Selecting Noise Measurement and Modeling Receiver Locations

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the Proposed Project. Existing land uses in the Project area were categorized by land use type and Activity Category as defined in Table 4-1, and the extent of frequent human use. As stated in the Protocol, noise abatement is only considered where frequent human use occurs and where a lowered noise level would be of benefit. Although all land uses are evaluated in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at multi-family residences.

The geometry of the Project relative to nearby existing and planned land uses was also identified.

Short-term measurement locations were selected to represent each major developed area within the Project area. Three long term measurement sites were selected to capture the diurnal traffic noise level pattern in the Project area. Short-term measurement locations were selected to serve as representative modeling locations. Several other non-measurement locations were selected as modeling locations.

5.1. Field Measurement Procedures

A field noise study was conducted in accordance with recommended procedures in TeNS. The following is a summary of the procedures used to collect short-term and long-term sound level data.

5.1.1. Short-Term Measurements

Short-term monitoring was conducted at eleven locations on Wednesday, March 8, 2023, using a Larson Davis Model LxT Precision Type 1 sound level meter (serial number 0001146). The calibration of the meter was checked before and after the measurement using a Larson Davis Model CA150 calibrator (serial number 2218). Measurements were taken over a 15-minute period at each site. Short-term monitoring was conducted at Activity Category B and C land uses. The short-term measurement locations are identified in Figure 5-1.

During the short-term measurements, field staff were by the meter (typically 15 minutes per location). Using this approach, those minutes when traffic noise was observed to be a dominant contributor to noise levels at a given measurement location could be distinguished from one-minute noise levels where other non-traffic noise sources (such as aircraft and lawn equipment) contributed significantly to existing noise levels. Vehicles

were classified as automobiles, medium-duty trucks, or heavy-duty trucks. An automobile was defined as a vehicle with two axles and four tires that are designed primarily to carry passengers. Small vans and light trucks were included in this category. Medium-duty trucks included all cargo vehicles with two axles and six tires. Heavy-duty trucks included all vehicles with three or more axles.

During the short-term measurements, wind speeds typically ranged from 2 to 5 miles per hour (mph). Temperatures ranged from 10–14°C (50–57°F), with relative humidity typically 70–90%.

5.1.2. Long -Term Measurements

Long-term monitoring was conducted at two locations (LT-1 and -2) using a Soft dB model Piccolo II Type 2 sound level meters (serial numbers P0222082209 and P0222022212). The purpose of these measurements was to identify variations in sound levels throughout the day and to adjust measurements taken outside the loudest hour to equal the loudest hour to calibrate the model using the hourly traffic data from the loudest hour. The long-term sound level data was collected over a 24-hour period on Wednesday, March 8, 2023. This measurement period was chosen during to represent typical traffic patterns in the Project area.

A second measurement was taken February 28, 2024, to confirm and provide additional characterization of the ambient conditions. The measurements taken in 2024 were taken at the same locations as LT-1 and LT2.

Long-term monitoring location L1 was located at the Indian Bluffs Apartment, APN 016-4293-72, along Mohave Drive on the west side of Reche Canyon Road, approximately 170 feet from the Reche Canyon Road edge-of-pavement (refer to Figure 5-1). This location is near the S3 measurement was taken.

Long-term monitoring location L2 was located at the Montecito Memorial Park and Mortuary on the east side of Reche Canyon Road, approximately 600 feet from the Reche Canyon Road and Washington Street edge-of-pavement (refer to Figure 5-1). This location is near the S8 measurement was taken.

5.2. Traffic Noise Levels Prediction Methods

Traffic noise levels were predicted using the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). TNM 2.5 is a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA-PD-96-010 (FHWA 1998a, 1998b). Key inputs to the traffic noise model were the locations of roadways, traffic mix and speed, shielding features (e.g., topography and buildings), noise barriers, ground type, and receivers. Three-dimensional representations of these inputs were developed using CAD drawings, aerials, and topographic contours provided by Nearmap.

Traffic noise was evaluated under existing conditions, Project completion year, and Project buildout year. Loudest-hour traffic volumes, vehicle classification percentages,

and traffic speeds under existing, Project completion year, and Project buildout year conditions were provided by KOA Traffic Engineers for input into the traffic noise model. Tables A-1 to A-3 in Appendix A summarize the traffic volumes and assumptions used for modeling existing and design-year conditions with and without the Project alternative.

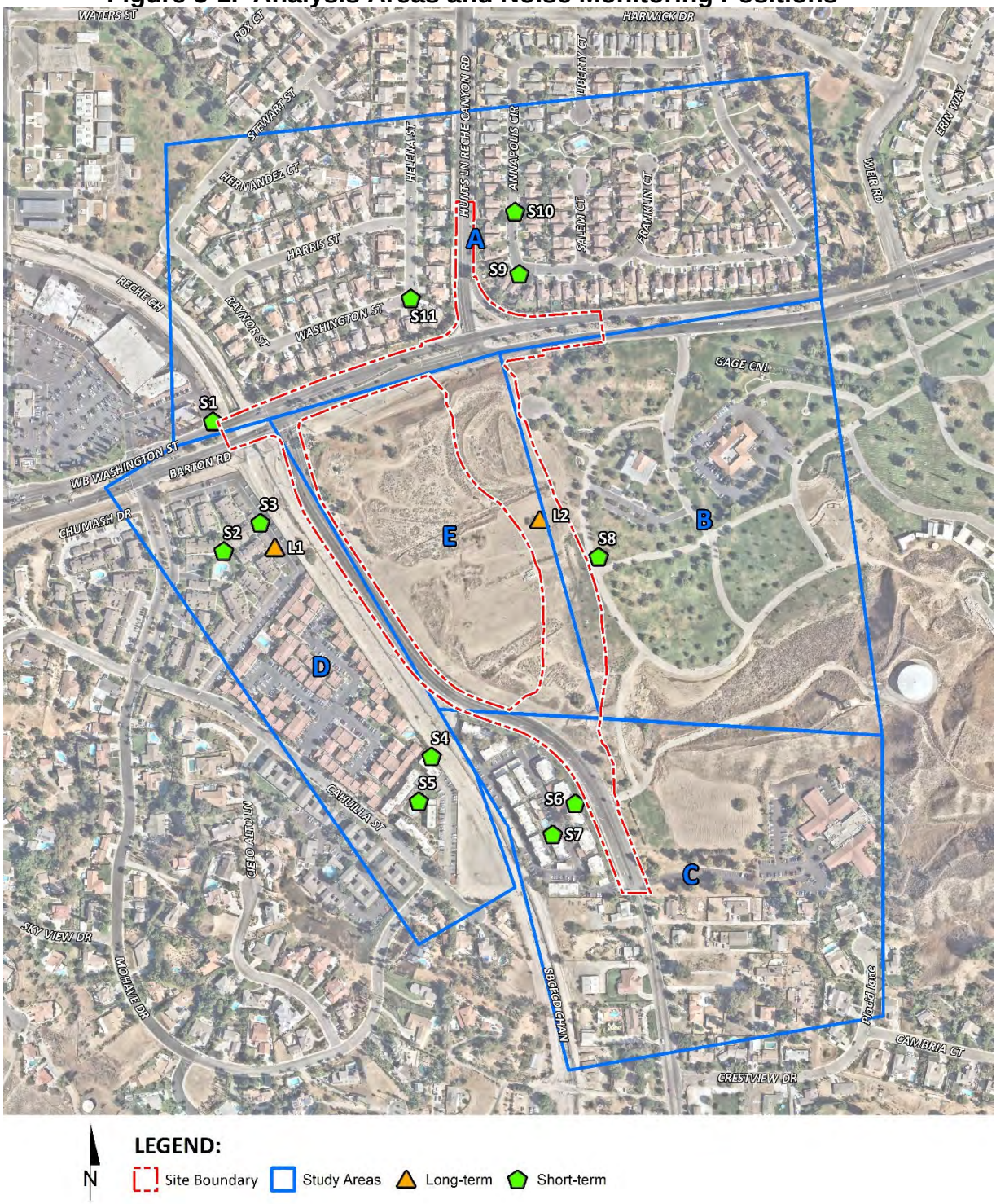
To validate the accuracy of the model calculations, TNM 2.5 was used to compare measured traffic noise levels to modeled noise levels at field measurement locations. For each measurement location, the measured noise level was adjusted upward to match the equivalent noise level during the period the highest hourly traffic volumes were counted. The counted traffic volumes were assigned to the corresponding Project area roadways to simulate the noise source strength at the roadways during the actual measurement period. Modeled and measured sound levels were then compared to determine the accuracy of the model and if additional adjustment of the model was necessary.

5.3. Methods for Identifying Traffic Noise Impacts and Consideration of Abatement

Traffic noise impacts are considered to occur at receptor locations where predicted design-year noise levels are 12 dB or more greater than existing noise levels, or where predicted design-year noise levels approach or exceed the NAC for the applicable activity category. Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility as required by 23 CFR 772 and the Protocol.

According to the Protocol, abatement measures are considered acoustically feasible if a minimum noise reduction of 5 dB at impacted receptor locations is predicted with implementation of the abatement measures. In addition, barriers should be designed to intercept the line-of-sight from the exhaust stack of a truck to the first tier of receivers, as required by the Highway Design Manual, Chapter 1100. Other factors that affect feasibility include topography, access requirements for driveways and ramps, presence of local cross streets, utility conflicts, other noise sources in the area, and safety considerations.

Figure 5-1. Analysis Areas and Noise Monitoring Positions



The overall reasonableness of noise abatement is determined by the following three factors:

- The noise reduction design goal.
- The cost of noise abatement.
- The viewpoints of benefited receivers (including property owners and residents of the benefited receivers).

The Caltrans' acoustical design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one benefited receptor. This design goal applies to any receptor and is not limited to impacted receivers.

The Protocol defines the procedure for assessing reasonableness of noise barriers from a cost perspective. Based on 2022 construction costs an allowance of $ 107,000 is provided for each benefited receptor (i.e., receivers that receive at least 5 dB of noise reduction from a noise barrier). The total allowance for each barrier is calculated by multiplying the number of benefited receivers by $ 107,000. If the estimated construction cost of a barrier is less than the total calculated allowance for the barrier, the barrier is considered reasonable from a cost perspective. The viewpoints of benefits receivers are determined by a survey that is typically conducted after completion of the noise study report. The process for conducting the survey is described in detail in the Protocol.

The noise study report identifies traffic noise impacts and evaluates noise abatement for acoustical feasibility. It also reports information that will be used in the reasonableness analysis including if the 7 dB design goal reduction in noise can be achieved and the abatement allowances. The noise study report does not make any conclusions regarding reasonableness. The feasibility and reasonableness of noise abatement is reported in the Noise Abatement Decision Report.

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Chapter 6. Existing Noise Environment

6.1. Existing Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the Proposed Project. The following land uses were identified in the Project area:

- Single family and multifamily residences (Activity Category B)
- A cemetery (Activity Category C)
- Commercial retail center (Activity Category E)
- Unpermitted Lands (Category G)

Noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at multi-family residences.

Land uses in the Project area have been grouped into a series of lettered analysis areas that are identified in Figure 5-1. Each of these analysis areas is considered to be acoustically equivalent.

- **North of Washington Street:** Land uses in this area (Area A) include residential and commercial retail land uses, which are separated by the Reche Canyon ditch. Land uses east of the ditch are primarily single-family residential land uses in two communities split by Hunts Lane. The residential land uses are classified under Activity Category B for reporting purposes. The land uses west of the ditch are retail land uses considered Category E land uses for reporting purposes.
- **East of Reche Canyon, South of Washington Street:** This area (Areas B and E) represents undeveloped land and unpermitted land and the Montecito Memorial Park and Mortuary. The undeveloped land within Area E is considered a Category G land use for reporting purposes and the cemetery is classified as a Category C land use for reporting purposes.
- **South of the southern access gate of Montecito Memorial Park and Mortuary:** Land uses in this area (Area C) include single-family and multi-family residential land uses. Land uses are classified under Activity Category B for reporting purposes.
- **West of Reche Canyon Road, south of Washington Street:** Land uses in this area (Area D) are primarily multi-family residential land uses. Land uses are classified under Activity Category B for reporting purposes.

6.2. Noise Measurement Results

The existing noise environment in the Project area is characterized below based on short- and long-term noise monitoring that was conducted.

6.2.1. Short-Term Monitoring

The primary source of noise in the Project area is traffic on Reche Canyon Road and Washington Street, other local roadways are secondary contributors to the ambient noise environment. Short-term (15-minute) noise measurements were conducted to document existing noise levels at representative receptor locations along the Project alignment during the peak noise hour based on the long-term measurement results. Short-term noise level measurements were conducted using a Larson Davis LxT Type 1 integrating sound level meter. Table 6-1 shows the results of the short-term noise level measurements along with the date, start time, duration, location, and noise sources for each site. Short-term noise level measurements S1 and S6 had direct line of sight to the adjacent roadways and were used to initially calibrate the noise model. Predicted noise levels were also calculated at all measurement locations in the Project area during the peak hour to verify the model. The short-term monitoring locations are shown on Figure 5-1. The noise monitoring results are included in Appendix C. Concurrent traffic counts are also provided in Appendix C.

Table 6-1. Summary of Short-Term Measurements

Position	Address	Area	Land Uses	Start Time	Duration (minutes)	Measured L_{eq}	Autos	Medium Trucks	Heavy Trucks	Observed Speed (mph)
S1	2053 Washington Street	A	Commercial	9:42	15:00	72	1,616	38	9	40
S2	Indian Bluffs Apartment, APN 016-4293-72, Mohave Drive	D	Residential	12:38	15:00	54.2	--	--	--	--
S3	Indian Bluffs Apartment, APN 016-4293-72, Mohave Drive	D	Residential	12:15	15:00	57	--	--	--	--
S4	Canyon Villa Apartments, APN 016-4231-39, Mohave Drive	D	Residential	13:44	15:00	57.3	--	--	--	--
S5	Canyon Villa Apartments, APN 016-4231-39, Mohave Drive	D	Residential	10:16	15:00	48.9	--	--	--	--
S6	Canyon Apartments, APN 016-4231-49, Reche Canyon	C	Residential	15:17	15:00	61.1	2,238	30	13	35
S7	Canyon Apartments, APN 016-4231-49, Reche Canyon	C	Residential	14:57	15:00	51.6	--	--	--	--
S8	Montecito Memorial Park and Mortuary	D	Cemetery	16:58	15:00	53.6	--	--	--	--
S9	2699 Annapolis Circle	A	Residential	17:39	15:00	52.7	--	--	--	--
S10	2711 Annapolis Circle	A	Residential	18:16	15:00	46.7	--	--	--	--
S11	2190 Mintzer	A	Residential	11:38	15:00	50.1	--	--	--	--

-- = Traffic not obscured.
Note: Refer to Figure 5-1 for measurement locations and boundaries of each area.

6.2.2. Long-Term Monitoring

Two long-term measurements were conducted within the Project area. The long-term noise level measurement was recorded using Piccolo 2 (Type 2) integrating sound level meter and dataloggers. The long-term noise level measurement were collected in the Indian Bluffs Apartment approximately 345 feet southwest of the intersection of Reche Canyon Road and Washington Street (L1) and west of the Montecito Memorial Park and Mortuary within the future Reche Canyon Road right-of-way (L2).

The long-term noise level measurement at LT-1, Table 6-2 and Figure 6-1, indicates that the daytime (7:00 a.m. to 10:00 p.m.) hourly noise levels range from 54.2 dBA L_{eq} to 59.5 dBA L_{eq} and the nighttime (10:00 p.m. to 7:00 a.m.) hourly noise levels range from 50.3 dBA L_{eq} to 60.9 dBA L_{eq}. The long-term noise level measurement at LT-2, Table 2 Figure 6-1, indicates that the daytime (7:00 a.m. to 10:00 p.m.) hourly noise levels range from 46.3 dBA L_{eq} to 55.4 dBA L_{eq} and the nighttime (10:00 p.m. to 7:00 a.m.) hourly noise levels range from 46.5 dBA L_{eq} to 57.6 dBA L_{eq}. At both long-term measurement locations, the peak noise hour occurs at 6:00 a.m. Peak hour noise level was 60.9 dBA L_{eq} and 57.6 at L1 and L2, respectively, on March 8, 2023, a second measurement was taken to verify the first on February 28, 2024. The purpose of the measurements is to describe variations in sound levels throughout the day over a period of several hours and to determine the difference between the short-term measured noise level outside the loudest hour and the loudest hour. The long-term noise monitoring location is shown on Figure 5-1 and included in Appendix D.

Table 6-2. Summary of Long-Term Monitoring

Hour Beginning	LT-1				LT-2			
	03/08/2024 (dBA L_{eq}[h])	Difference from Loudest Hour (dB)	2/28/2024 (dBA L_{eq}[h])	Difference from Loudest Hour (dB)	03/08/2024 (dBA L_{eq}[h])	Difference from Loudest Hour (dB)	2/28/2024 (dBA L_{eq}[h])	Difference from Loudest Hour (dB)
12:00 a.m.	55.1	-5.8	54.1	-5.0	51.9	-5.6	51.6	-3.7
1:00 a.m.	52.9	-7.9	52.0	-7.1	49.0	-8.6	48.6	-6.7
2:00 a.m.	50.3	-10.5	51.8	-7.3	46.5	-11.1	48.2	-7.1
3:00 a.m.	52.5	-8.3	51.4	-7.7	50.0	-7.6	49.7	-5.6
4:00 a.m.	57.1	-3.7	56.6	-2.5	53.4	-4.1	50.1	-5.2
5:00 a.m.	58.9	-1.9	57.3	-1.8	55.6	-2.0	54.3	-1.0
6:00 a.m.	**60.9**	0.0	**59.1**	0.0	**57.6**	0.0	**55.3**	0.0
7:00 a.m.	59.2	-1.6	58.5	-0.6	54.3	-3.3	54.0	-1.3
8:00 a.m.	59.1	-1.8	58.2	-0.9	51.8	-5.8	51.4	-3.9
9:00 a.m.	59.5	-1.3	56.2	-2.9	46.3	-11.3	45.8	-9.5
10:00 a.m.	56.1	-4.7	55.5	-3.6	49.6	-8.0	50.0	-5.3
11:00 a.m.	55.9	-4.9	57.6	-1.5	47.7	-9.9	54.2	-1.1
12:00 p.m.	54.2	-6.7	58.7	-0.4	46.5	-11.1	55.1	-0.2
1:00 p.m.	58.1	-2.7	57.7	-1.4	52.6	-4.9	51.7	-3.6
2:00 p.m.	56.5	-4.4	56.0	-3.1	50.9	-6.7	50.8	-4.5
3:00 p.m.	58.6	-2.3	58.2	-0.9	52.0	-5.5	51.3	-4.0
4:00 p.m.	56.4	-4.4	55.7	-3.4	51.5	-6.1	51.5	-3.8
5:00 p.m.	55.4	-5.5	55.2	-3.9	52.5	-5.1	53.0	-2.3
6:00 p.m.	55.7	-5.2	54.7	-4.4	52.6	-5.0	51.4	-3.9
7:00 p.m.	56.5	-4.3	55.8	-3.3	53.5	-4.1	53.3	-2.0
8:00 p.m.	59.0	-1.9	55.6	-3.5	55.4	-2.1	53.1	-2.2
9:00 p.m.	57.0	-3.8	56.6	-2.5	53.3	-4.3	52.3	-3.0
10:00 p.m.	56.3	-4.6	55.1	-4.0	54.7	-2.9	54.2	-1.1
11:00 p.m.	55.7	-5.2	54.8	-4.3	53.2	-4.4	52.7	-2.6

Note: Highest noise hour noise level is bolded.

Figure 6-1. Long-Term Monitoring at Location LT-1, March 8, 2023

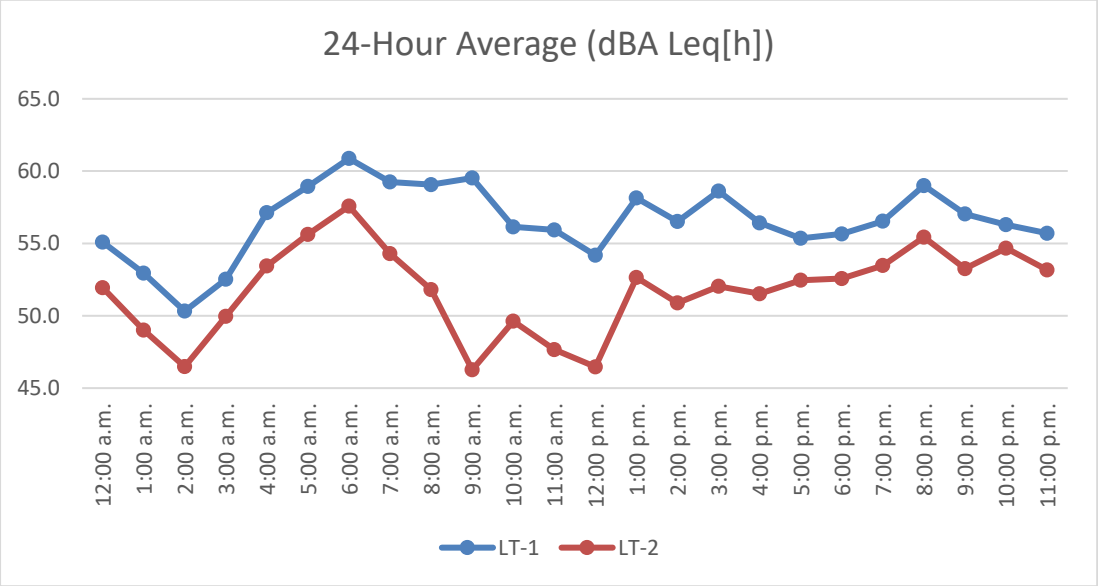
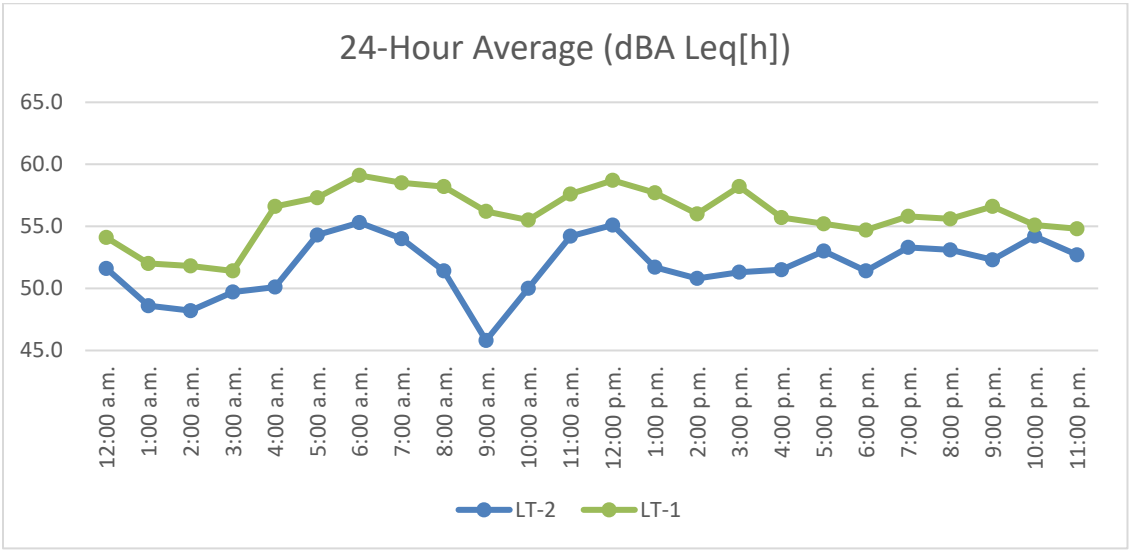


Figure 6-2. Long-Term Monitoring at Location LT-1, February 28, 2024



6.2.3. Noise Model Calibration

Three individual calibration model runs were conducted using the vehicle classification counts and vehicle speed data collected concurrent with the ambient noise monitoring. The results of these model runs were compared to the measured short-term ambient noise levels to validate the accuracy of TNM 2.5. Correction factors known as K-factors were applied to each of the modeled receptor locations so that the monitored and modeled noise levels were the same. Table 6-4 shows the measured short-term ambient noise levels, the modeled noise levels using traffic counts and observed vehicle speeds

identified during noise monitoring, and the resulting K-factors adjustments at each of the calibration locations.

Table 6-4. Initial Short-Term Model Calibration Results

ID	Measured Noise Level dBA Leq)	Modeled Noise Level (dBA Leq)	K-Factor (dBA Leq)	Receptors Represented
ST-1	72	71.1	-0.9	R-1 to R-5
ST-6	61.1	62.4	1.3	R-9 to R-11

All ST noise measurements were taken outside the loudest hour and were adjusted to reflect the loudest hour and were normalized (i.e., adjusted) to reflect the loudest hour based on the results of the 24-hour measurements (see Table 6-5).

Table 6-5. Short-Term Noise Measurement Comparison to Loudest Hour

Location	dBA Leq	Time	Relative Long-term Noise Level	Difference	Loudest Hour Noise Level
S1	72.0	9:41	L1	-1.3	73.3
S2	54.2	12:37	L1	-6.7	60.9
S3	57.0	11:51	L1	-4.9	61.9
S4	57.3	13:44	L1	-2.7	60
S5	48.9	10:16	L1	-4.7	53.6
S6	61.1	15:17	L1	-2.7	63.8
S7	51.6	14:57	L1	-2.7	54.3
S8	53.6	16:57	L2	-6.1	59.7
S9	52.7	17:39	L2	-5.1	57.8
S10	46.7	18:16	L2	-5	51.7
S11	50.1	11:38	L2	-9.9	60
L1	60.9	6:00	L1	0	60.9
L2	57.6	6:00	L2	0	57.6

TNM 2.5 was used to compare measured traffic noise levels to modeled noise levels at field measurement locations during the peak hour traffic conditions on the day of the measurements. Table 6-6 compares measured and modeled noise levels at all measurement locations (see Figure 5-1). According to the TeNS, “if modeled sound levels do not match measured sound levels within ±3 dB the model parameters should be reviewed and adjusted if necessary to ensure that they accurately represent actual site conditions.” The predicted sound levels are within 3 dB of the measured sound levels and

are, therefore, considered to be in reasonable agreement with the measured sound levels. Therefore, no further adjustment of the model was necessary.

Table 6-6. Comparison of Measured to Predicted Sound Levels in the TNM Model

Measurement Position	Measured Sound Level (dBA)	Predicted Sound Level (dBA)	Measured minus Predicted (dB)
S1	73.3	70.8	2.5
S2	60.9	58.3	2.6
S3	61.9	62.8	-0.9
S4	60	61.7	-1.7
S5	53.6	53.8	-0.2
S6	63.8	61.9	1.9
S7	54.3	55.8	-1.5
S8	59.7	57.6	2.1
S9	57.8	56.9	0.9
S10	51.7	54.5	-2.8
S11	60	57.9	2.1
L1	60.9	58.8	2.1
L2	57.6	58.2	-0.6

Chapter 7. Future Noise Environment, Impacts, and Considered Abatement

7.1. Future Noise Environment and Impacts

Table B-1 in Appendix B summarizes the traffic noise modeling results for existing conditions, completion year, and buildout year conditions with and without the Project. Modeled receiver areas A through D are shown in Figure 7-1. Predicted design-year traffic noise levels with the Project are compared to existing conditions and to design-year No-Project conditions. The comparison to existing conditions is included in the analysis to identify traffic noise impacts as defined under 23 CFR 772. The comparison to No-Project conditions indicates the direct effect of the Project. Modeling results in Table B-1 indicate the following:

Area A

The traffic noise modeling results in Table B-1 indicate that traffic noise levels at residences in Area A, as shown on Figures 7-2 and 7-3, are predicted to be in the range of 55.3 to 64.7 dBA L_{eq}(h) under the existing conditions, 56.7 to 66.3 dBA in the design-year without the Project, and 56.8 to 65.9 dBA in the design-year with the Project. The results also indicate that the change in noise levels between existing conditions and the design-year without the Project is predicted to range from 1.2 to 2.3 dBA and the Project related change in noise level in the opening year are predicted to be -4.0 to 0.5 dBA. The reductions in noise levels in Area A are due to redistribution in traffic due to the new alignment. Because the predicted noise levels in the design-year are not predicted to exceed the noise abatement criterion (67 dBA Leq[h]) or result in a substantial increase in noise, no traffic noise impacts are predicted in Area A.

Area B

The traffic noise modeling results in Table B-1 indicate that traffic noise levels at cemetery in Area B, as shown on Figure 7-4, are predicted to be in the range of 59.9 to 63.3 dBA L_{eq}(h) under the existing conditions, 59.4 to 64.5 dBA in the design-year without the Project, and 64.1 to 64.8 dBA in the design-year with the Project. The results also indicate that the increase in noise levels between existing conditions and the design-year without the Project are predicted to range from 1.2 to 1.5 dBA and the Project related changes in the opening year are predicted to range from -0.1 to 5.2 dBA. The reductions in noise levels in Area B are due to redistribution in traffic due to the new alignment. The reductions in noise levels in Area B are due to redistribution in traffic due to the new alignment. Since the predicted noise levels in the design-year are not predicted to exceed the noise abatement criterion (67 dBA Leq[h]) or result in a substantial increase in noise, no traffic noise impacts are predicted in Area B.

Figure 7-1: Receptor Areas

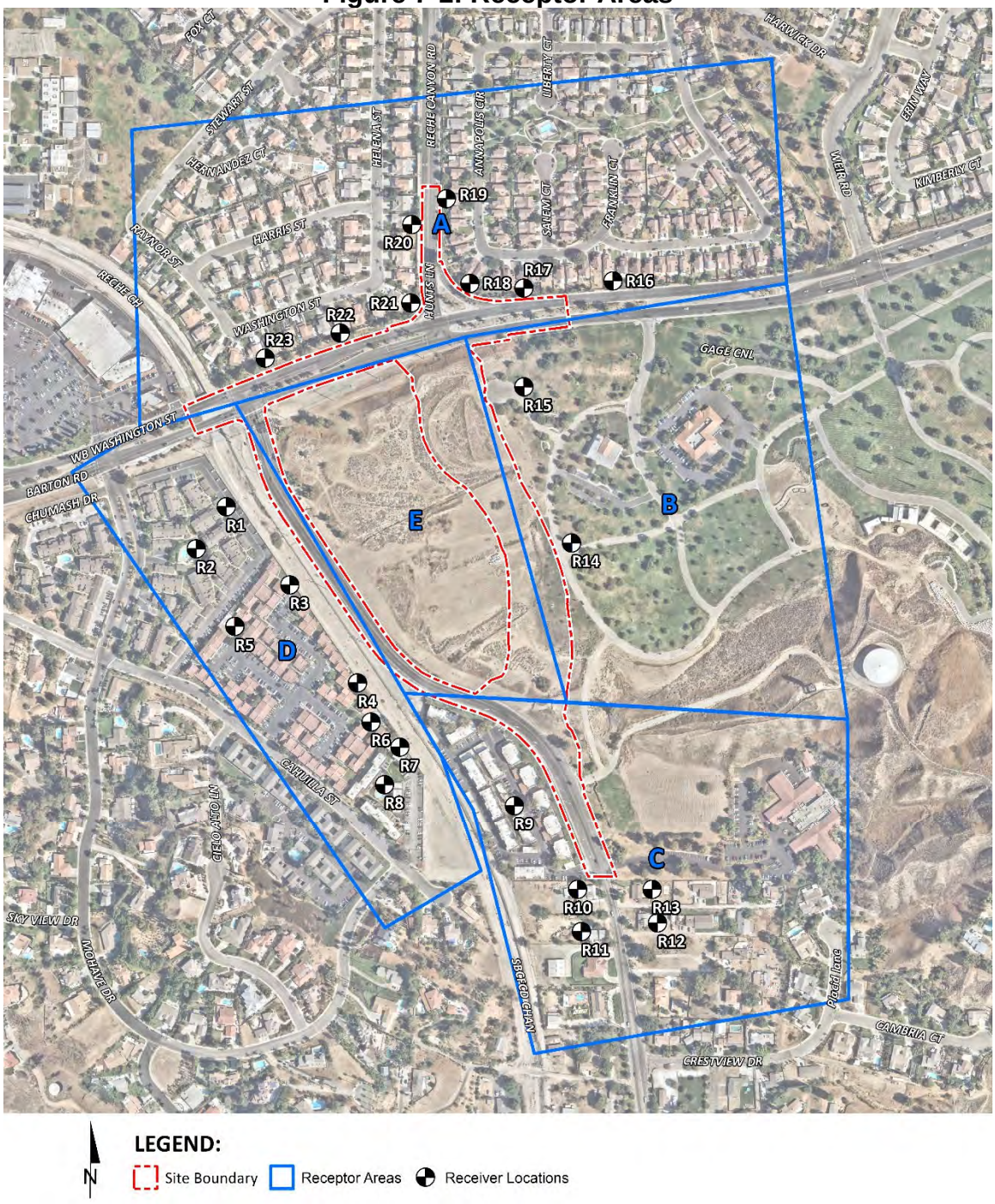


Figure 7-2: Area A - East

Figure 7-3: Area A - West

Figure 7-4: Area B

Area C

The traffic noise modeling results in Table B-1 indicate that traffic noise levels at residences in Area C, as shown on Figure 7-5, are predicted to be in the range of 55.4 to 62.0 dBA L_{eq}(h) under the existing conditions, 57.0 to 63.5 dBA in the design-year without the Project, and 55.7 to 63.9 dBA in the design-year with the Project. The results also indicate that the increase in noise levels between existing conditions and the design-year without the Project are predicted to range from 1.4 to 1.6 dBA and the Project related changes in the opening year are predicted to range from -1.3 to 0.5 dBA. The reductions in noise levels in Area A are due to redistribution in traffic due to the new alignment. Because the predicted noise levels in the design-year are not predicted to exceed the noise abatement criterion (67 dBA L_{eq}[h]) or result in a substantial increase in noise, no traffic noise impacts are predicted in Area C.

Area D

The traffic noise modeling results in Table B-1 indicate that traffic noise levels at residences in Area D, as shown on Figures 7-6 and 7-7, are predicted to be in the range of 53.7 to 63.1 dBA L_{eq}(h) under the existing conditions, 55.4 to 64.9 dBA in the design-year without the Project, and 54.1 to 62.5 dBA in the design-year with the Project. The results also indicate that the increase in noise levels between existing conditions and the design-year without the Project are predicted to range from 1.5 to 2.2 dBA and the Project related changes in the opening year are predicted to range from -2.4 to -1.0 dBA. The reductions in noise levels in Area A are due to redistribution in traffic due to the new alignment. Because the predicted noise levels in the design-year are not predicted to approach or exceed the noise abatement criterion (67 dBA L_{eq}[h]) or result in a substantial increase in noise, no traffic noise impacts are predicted in Area D.

Area E

No receivers are located in Area E.

7.2. Preliminary Noise Abatement Analysis

Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. According to 23 CFR 772(13)(c) and 772(15)(c), federal funding may be used for the following abatement measures:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way.
- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments.

Figure 7-5: Area C

Figure 7-6: Area D - North

Figure 7-7: Area D - South

- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise.
- Noise insulation of Activity Category D land use facilities listed in Table 1. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

Noise barriers are the only form of noise abatement considered for this Project. Each noise barrier evaluated has been evaluated for feasibility based on achievable noise reduction. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated by multiplying the number of benefited receivers by $107,000.

For any noise barrier to be considered reasonable from a cost perspective the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier must include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, retaining walls, landscaping for graffiti abatement, and right-of-way costs. Construction cost estimates are not provided in this NSR, but are presented in the Noise Abatement Decision Report (NADR). The NADR is a design responsibility and is prepared to compile information from the NSR, other relevant environmental studies, and design considerations into a single, comprehensive document before public review of the Project. The NADR is prepared by the project engineer after completion of the NSR and prior to publication of the draft environmental document. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the project engineer based on site-specific conditions. Construction cost estimates are compared to reasonableness allowances in the NADR to identify which wall configurations are reasonable from a cost perspective.

The following is a discussion of noise abatement considered for each evaluation area where traffic noise impacts are predicted.

7.2.1. Area A

No traffic noise impacts are predicted for Area A. Accordingly, noise abatement does not need to be considered in this area.

7.2.2. Area B

No traffic noise impacts are predicted for Area B. Accordingly, noise abatement does not need to be considered in this area.

7.2.3. Area C

No traffic noise impacts are predicted for Area C. Accordingly, noise abatement does not need to be considered in this area.

7.2.4. Area D

No traffic noise impacts are predicted for Area D. Accordingly, noise abatement does not need to be considered in this area.

7.2.5. Area E

No traffic noise impacts are predicted for Area E. Accordingly, noise abatement does not need to be considered in this area.

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Chapter 8. Construction Noise

8.1. Purpose

During construction of the Proposed Project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Noise from Project construction would be regulated through Caltrans Standard Specifications. To minimize the construction noise impacts for sensitive land adjacent to the Project site, construction noise is regulated by Caltrans Standard Specifications in Section 14-8.02, "Noise Control." These provisions shall be adhered to during Project construction. Noise associated with construction is controlled by Caltrans Standard Specification Section 14-8.02, "Noise Control," which states the following:

> Do not exceed 86 dBA L_{max} at 50 feet from the job site activities from 9 p.m. to 6 a.m.
>
> Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

8.2. Typical Construction Noise Levels

Table 8-1 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 82 to 89 dBA at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 8-1. Construction Equipment Noise

Equipment	Maximum Noise Level (dBA L_{max} at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: Federal Transit Administration, 2006 See also: http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans Standard Specifications Section 14.8-02. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise.

Potential roadway construction areas are expected to require the use of scrapers, bulldozers, water trucks, and pickup trucks. Noise associated with the use of construction equipment is estimated between 82 and 89 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 8-1, the maximum noise level generated by each scraper is assumed to be approximately 87 dBA L_{max} at 50 ft from the scraper in operation. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks and pickup trucks is approximately 86 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 91 dBA L_{max} (at a distance of 50 ft from an active construction area). The closest sensitive receptor locations are located approximately 40 ft from the Project construction areas. Therefore, these receptor locations may be subject to short-term noise reaching 91 dBA L_{max} generated by construction activities along the Project alignment.

8.3. Construction Noise Level Reduction Measures

Construction of the Proposed Project is anticipated to generate high noise levels at certain areas in the proximity of construction activity areas. Construction noise is regulated by Caltrans' Standard Specifications in Section 14-8.02, "Noise Control". Section 14-8.02 states that "*Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m. Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.*"

Chapter 9. References

Ming Guan. September 2021. The Riche Canyon Road Extension to Hunts Lane Project. Koa Corporation. Volume: 1-117.

Caltrans. 2013. Technical Noise Supplement. September. Sacramento, CA: Environmental Program, Noise, Air Quality, and Hazardous Waste Management Office. Sacramento, CA. Available: (http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf).

———. 2011. Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects. May. Sacramento, CA. Available: (http://www.dot.ca.gov/hq/env/noise/pub/ca_tnap_may2011.pdf).

Caltrans. 2013. Transportation and Construction Vibration Guidance Manual. September. Sacramento, CA: Environmental Program, Noise, Air Quality, and Hazardous Waste Management Office. Sacramento, CA. Available: (http://www.dot.ca.gov/hq/env/noise/pub/TCVGM_Sep13_FINAL.pdf)

Federal Highway Administration. 2011. Highway Traffic Noise: Analysis and Abatement Guidance. December. Washington D.C. FHWA-HEP-10-025. Available: (http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf)

———. 1998a. FHWA Traffic Noise Model, Version 1.0 User's Guide. January. FHWA-PD-96-009. Washington D.C.

———. 1998b. FHWA Traffic Noise Model, Version 1.0. February. FHWA-PD-96-010. Washington D.C.

———. 2006. Roadway Construction Noise Model. February 15, 2006. Available: (http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/).

Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment.* (DOT-T-95-16.) Office of Planning, Washington, DC. Prepared by Harris Miller & Hanson, Inc. Burlington, MA.

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Appendix A Traffic Data

Table A-1. Traffic Data for Existing Conditions

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/MT/HT)
Washington Street	w/o Reche Canyon Rd	EB	964	97.81%	943	1.65%	16	0.54%	5	40
		WB	964	97.81%	943	1.65%	16	0.54%	5	40
Washington Street	Reche Canyon Rd to Hunts Ln	EB	1,375	97.81%	1,344	1.65%	23	0.54%	7	40
		WB	1,375	97.81%	1,344	1.65%	23	0.54%	7	40
Washington Street	e/o Hunts Ln	EB	1,375	97.81%	1,344	1.65%	23	0.54%	7	40
		WB	1,375	97.81%	1,344	1.65%	23	0.54%	7	40
Reche Canyon Road	Washington St to Project segment	NB	767	98.29%	754	1.45%	11	0.26%	2	45
		SB	767	98.29%	754	1.45%	11	0.26%	2	45
Reche Canyon Road	s/o Project segment	NB	767	98.29%	754	1.45%	11	0.26%	2	45
		SB	767	98.29%	754	1.45%	11	0.26%	2	45
Hunts Lane	n/o Washington St	NB	266	98.29%	262	1.45%	4	0.26%	1	45
		SB	266	98.29%	262	1.45%	4	0.26%	1	45
Project segment	Washington St to Reche Canyon Rd	NB	0	98.29%	0	1.45%	0	0.26%	0	45
		SB	0	98.29%	0	1.45%	0	0.26%	0	45

Table A-2. Traffic Data for Design Year No-Project Conditions

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/MT/HT)
Washington Street	w/o Reche Canyon Rd	EB	1,717	97.81%	1,679	1.65%	28	0.54%	9	40
		WB	1,900	97.81%	1,858	1.65%	31	0.54%	10	40
Washington Street	Reche Canyon Rd to Hunts Ln	EB	2,004	97.81%	1,960	1.65%	33	0.54%	11	40
		WB	2,133	97.81%	2,087	1.65%	35	0.54%	12	40
Washington Street	e/o Hunts Ln	EB	1,701	97.81%	1,664	1.65%	28	0.54%	9	40
		WB	1,853	97.81%	1,812	1.65%	31	0.54%	10	40
Reche Canyon Road	Washington St to Project segment	NB	1,105	98.29%	1,086	1.45%	16	0.26%	3	45
		SB	1,051	98.29%	1,033	1.45%	15	0.26%	3	45
Reche Canyon Road	s/o Project segment	NB	1,105	98.29%	1,086	1.45%	16	0.26%	3	45
		SB	1,051	98.29%	1,033	1.45%	15	0.26%	3	45
Hunts Lane	n/o Washington St	NB	441	98.29%	433	1.45%	6	0.26%	1	45
		SB	418	98.29%	411	1.45%	6	0.26%	1	45
Project segment	Washington St to Reche Canyon Rd	NB	0	98.29%	0	1.45%	0	0.26%	0	45
		SB	0	98.29%	0	1.45%	0	0.26%	0	45

Table A-3. Traffic Data for Design Year with Project Conditions

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/MT/HT)
Washington Street	w/o Reche Canyon Rd	EB	1,680	97.81%	1,643	1.65%	28	0.54%	9	40
		WB	1,888	97.81%	1,847	1.65%	31	0.54%	10	40
Washington Street	Reche Canyon Rd to Hunts Ln	EB	1,356	97.81%	1,326	1.65%	22	0.54%	7	40
		WB	1,514	97.81%	1,481	1.65%	25	0.54%	8	40
Washington Street	e/o Hunts Ln	EB	1,731	97.81%	1,693	1.65%	29	0.54%	9	40
		WB	1,879	97.81%	1,838	1.65%	31	0.54%	10	40
Reche Canyon Road	Washington St to Project segment	NB	316	98.29%	311	1.45%	5	0.26%	1	45
		SB	266	98.29%	262	1.45%	4	0.26%	1	45
Reche Canyon Road	s/o Project segment	NB	1,127	98.29%	1,108	1.45%	16	0.26%	3	45
		SB	1,072	98.29%	1,053	1.45%	16	0.26%	3	45
Hunts Lane	n/o Washington St	NB	515	98.29%	507	1.45%	7	0.26%	1	45
		SB	520	98.29%	511	1.45%	8	0.26%	1	45
Project segment	Washington St to Reche Canyon Rd	NB	811	98.29%	797	1.45%	12	0.26%	2	45
		SB	806	98.29%	792	1.45%	12	0.26%	2	45

Table A-4. Traffic Data for Horizon Year with Project Conditions

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/MT/HT)
Washington Street	w/o Reche Canyon Rd	EB	2,111	97.81%	2,065	1.65%	35	0.54%	11	40
		WB	2,353	97.81%	2,302	1.65%	39	0.54%	13	40
Washington Street	Reche Canyon Rd to Hunts Ln	EB	2,453	97.81%	2,399	1.65%	40	0.54%	13	40
		WB	2,540	97.81%	2,484	1.65%	42	0.54%	14	40
Washington Street	e/o Hunts Ln	EB	1,937	97.81%	1,895	1.65%	32	0.54%	10	40
		WB	2,179	97.81%	2,131	1.65%	36	0.54%	12	40
Reche Canyon Road	Washington St to Project segment	NB	1,596	98.29%	1,569	1.45%	23	0.26%	4	45
		SB	1,441	98.29%	1,416	1.45%	21	0.26%	4	45
Reche Canyon Road	s/o Project segment	NB	1,596	98.29%	1,569	1.45%	23	0.26%	4	45
		SB	1,441	98.29%	1,416	1.45%	21	0.26%	4	45
Hunts Lane	n/o Washington St	NB	652	98.29%	641	1.45%	9	0.26%	2	45
		SB	497	98.29%	489	1.45%	7	0.26%	1	45
Project segment	Washington St to Reche Canyon Rd	NB	0	98.29%	0	1.45%	0	0.26%	0	45
		SB	0	98.29%	0	1.45%	0	0.26%	0	45

Table A-5. Traffic Data for Horizon Year with Project Conditions

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/MT/HT)
Washington Street	w/o Reche Canyon Rd	EB	2,003	97.81%	1,959	1.65%	33	0.54%	11	40
		WB	2,295	97.81%	2,245	1.65%	38	0.54%	12	40
Washington Street	Reche Canyon Rd to Hunts Ln	EB	1,490	97.81%	1,458	1.65%	25	0.54%	8	40
		WB	1,706	97.81%	1,669	1.65%	28	0.54%	9	40
Washington Street	e/o Hunts Ln	EB	1,965	97.81%	1,922	1.65%	32	0.54%	11	40
		WB	2,202	97.81%	2,154	1.65%	36	0.54%	12	40
Reche Canyon Road	Washington St to Project segment	NB	589	98.29%	579	1.45%	9	0.26%	2	45
		SB	513	98.29%	504	1.45%	7	0.26%	1	45
Reche Canyon Road	s/o Project segment	NB	1,617	98.29%	1,590	1.45%	23	0.26%	4	45
		SB	1,467	98.29%	1,442	1.45%	21	0.26%	4	45
Hunts Lane	n/o Washington St	NB	690	98.29%	678	1.45%	10	0.26%	2	45
		SB	595	98.29%	585	1.45%	9	0.26%	2	45
Project segment	Washington St to Reche Canyon Rd	NB	1,028	98.29%	1,011	1.45%	15	0.26%	3	45
		SB	955	98.29%	939	1.45%	14	0.26%	2	45

Appendix B Predicted Future Noise Levels and Noise Barrier Analysis

Table B-1. Predicted Opening Year Noise Level Analysis

Receptor I.D.	Area	Land Use	Number of Dwelling Units	Address	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA				Activity Category (NAC)	Impact Type
						Design Year Noise Level without Project Leq(h), dBA	Design Year Noise Level with Project Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project Minus No Project Conditions Leq(h), dBA		
S1	A	Commercial	n/a	2053 Washington Street	71.6	74.3	74.2	2.7	-0.1	E / --	--
S2	D	Residential	n/a	Indian Bluffs Apartment , APN 016-4293-72, Mohave Drive	58.8	61.0	60.0	2.2	-1	B / 67	None
S3	D	Residential	n/a	Indian Bluffs Apartment , APN 016-4293-72, Mohave Drive	63.1	64.9	62.5	1.8	-2.4	B / 67	None
S4	D	Residential	n/a	Canyon Villa Apartments, APN 016-4231-39, Mohave Drive	61.6	63.1	61.0	1.5	-2.1	B / 67	None
S5	D	Residential	n/a	Canyon Villa Apartments, APN 016-4231-39, Mohave Drive	53.7	55.4	54.1	1.7	-1.3	B / 67	None
S6	C	Residential	n/a	Canyon Apartments, APN 016-4231-49, Reche Canyon	61.5	63.0	63.1	1.5	0.1	B / 67	None
S7	C	Residential	n/a	Canyon Apartments, APN 016-4231-49, Reche Canyon	55.4	57.0	55.7	1.6	-1.3	B / 67	None
S8	B	Cemetery	n/a	Montecito Memorial Park and Mortuary	58.1	59.6	64.8	1.5	5.2	C / 67	None
S9	A	Residential	n/a	2699 Annapolis Circle	58.3	59.6	59.6	1.3	0	B / 67	None
S10	A	Residential	n/a	2711 Annapolis Circle	55.3	56.7	56.8	1.4	0.1	B / 67	None
S11	A	Residential	n/a	2190 Mintzer	59.1	60.8	60.4	1.7	-0.4	B / 67	None
L1	D	Residential	n/a	Indian Bluffs Apartment , APN 016-4293-72, Mohave Drive	59.0	60.9	58.9	1.9	-2	B / 67	None
L2	B	ROW	n/a	Montecito Memorial Park and Mortuary	58.8	60.3	73.7	1.5	13.4	C / --	--
R1	A	Residential	10	Indian Knolls Condominiums, 1210 Mohave Dr.	64.5	66.3	63.6	1.8	-2.7	B / 67	None
R2	A	Residential	1	Indian Knolls Condominiums, Swimming Pool	59.9	62.0	60.6	2.1	-1.4	B / 67	None
R3	A	Residential	10	Canyon Bluffs, 2255 Cahullia St.	64.7	66.2	62.2	1.5	-4	B / 67	None
R4	A	Residential	10	Canyon Bluffs, 2255 Cahullia St.	63.6	65.1	61.5	1.5	-3.6	B / 67	None
R5	A	Residential	1	Canyon Bluffs, 2255 Cahullia St., Northern Swimming Pool	57.2	59.1	57.6	1.9	-1.5	B / 67	None
R6	A	Residential	1	Canyon Bluffs, 2255 Cahullia St., Southern Swimming Pool	61.7	63.2	60.4	1.5	-2.8	B / 67	None
R7	A	Residential	6	Canyon Villas, 2265 Cahullia St.	60.9	62.4	60.5	1.5	-1.9	B / 67	None

Table B-1. Predicted Opening Year Noise Level Analysis

Receptor I.D.	Area	Land Use	Number of Dwelling Units	Address	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA				Activity Category (NAC)	Impact Type
						Design Year Noise Level without Project Leq(h), dBA	Design Year Noise Level with Project Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project Minus No Project Conditions Leq(h), dBA		
R8	A	Residential	1	Canyon Villas, 2265 Cahullia St., Swimming Pool	58.2	59.8	58.4	1.6	-1.4	B / 67	None
R9	C	Residential	1	1333 Reche Canyon Rd.	60.2	61.7	61.3	1.5	-0.4	B / 67	None
R10	C	Residential	1	11528 Reche Canyon Rd.	62.0	63.5	63.9	1.5	0.4	B / 67	None
R11	C	Residential	1	11548 Reche Canyon Rd.	62.0	63.4	63.9	1.4	0.5	B / 67	None
R12	C	Residential	1	11541 Reche Canyon Rd.	61.9	63.4	63.8	1.5	0.4	B / 67	None
R13	C	Residential	1	11527 Reche Canyon Rd.	59.5	61.0	61.5	1.5	0.5	B / 67	None
R14	B	Cemetery	1	3520 E Washington St.	57.9	59.4	64.1	1.5	4.7	C / 67	None
R15	B	Cemetery	1	3520 E Washington St	63.3	64.5	64.4	1.2	-0.1	C / 67	None
R16	A	Residential	7	2679 Annapolis Cir.	63.1	64.3	64.3	1.2	0	B / 67	None
R17	A	Residential	5	2693 Annapolis Cir.	63.5	64.7	64.6	1.2	-0.1	B / 67	None
R18	A	Residential	5	2699 Annapolis Cir.	59.9	61.2	61.2	1.3	0	B / 67	None
R19	A	Residential	5	2712 Annapolis Cir.	61.5	63.3	63.7	1.8	0.4	B / 67	None
R20	A	Residential	5	1066 Helena St.	63.6	65.4	65.9	1.8	0.5	B / 67	None
R21	A	Residential	3	2190 Mintzer St.	60.2	61.9	61.5	1.7	-0.4	B / 67	None
R22	A	Residential	4	2160 Mintzer St.	62.1	63.9	62.7	1.8	-1.2	B / 67	None
R23	A	Residential	4	2110 Mintzer St.	62.5	64.8	64.1	2.3	-0.7	B / 67	None

Note: All NAC are exterior unless note. A/E= Future noise conditions approach or exceed the Noise Abatement Criteria; SI = Substantial Increase

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Appendix C Supplemental Data

Summary

File Name on Meter	LxT_Data.037.s
File Name on PC	LxT_0001146-20230308 094157-LxT_Data.037.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S1
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 09:41:57
Stop	2023-03-08 10:03:20
Duration	00:21:22.9
Run Time	00:21:22.9
Pause	00:00:00.0
Pre-Calibration	2023-03-08 09:41:07
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	144.9 dB

	A	C	Z
Under Range Peak	**100.8**	97.8	102.8 dB
Under Range Limit	**38.0**	37.7	44.7 dB
Noise Floor	28.9	28.5	35.6 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{Seq}	72.0 dB	
LASE	103.1 dB	
EAS	2.259 mPa^2h	
EAS8	50.717 mPa^2h	
EAS40	253.583 mPa^2h	
$LA_{peak\ (max)}$	2023-03-08 09:59:06	109.7 dB
LAS_{max}	2023-03-08 09:59:07	98.6 dB
LAS_{min}	2023-03-08 09:51:15	52.0 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	1	5.6 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	72.0	72.0	-99.9	72.0	72.0	-99.9

LC_{Seq}	79.1 dB
LA_{Seq}	72.0 dB
LC_{Seq} - LA_{Seq}	7.1 dB
LAI_{eq}	75.4 dB
LA_{eq}	72.0 dB
LAI_{eq} - LA_{eq}	3.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	72.0					
$L_{S(max)}$	98.6	2023/03/08 9:59:07				
$L_{S(min)}$	52.0	2023/03/08 9:51:15				
$L_{Peak(max)}$	109.7	2023/03/08 9:59:06				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	1	
OBA Overload Duration	2.1	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.20	0.20	%
Projected Dose	4.48	4.48	%
TWA (Projected)	67.6	67.6	dB
TWA (t)	45.2	45.2	dB
Lep (t)	58.5	58.5	dB

Statistics

LAS 2.00	75.0	dB
LAS 5.00	72.5	dB
LAS 10.00	71.0	dB
LAS 25.00	68.5	dB
LAS 50.00	65.0	dB
LAS 90.00	57.9	dB

Summary

File Name on Meter	LxT_Data.027.s
File Name on PC	LxT_0001146-20230308 123757-LxT_Data.027.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S2
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 12:37:57
Stop	2023-03-08 12:53:57
Duration	00:16:00.7
Run Time	00:16:00.7
Pause	00:00:00.0
Pre-Calibration	2023-03-08 12:37:04
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.7 dB

	A	C	Z
Under Range Peak	**101.6**	98.6	103.6 dB
Under Range Limit	**38.8**	38.5	45.5 dB
Noise Floor	29.7	29.3	36.4 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{eq}	54.2 dB	
LASE	84.0 dB	
EAS	28.077 µPa²h	
EAS8	841.686 µPa²h	
EAS40	4.208 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 12:46:04	87.9 dB
LAS_{max}	2023-03-08 12:46:10	72.9 dB
LAS_{min}	2023-03-08 12:53:40	43.9 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	54.2	54.2	-99.9	54.2	54.2	-99.9

LC_{eq}	65.6 dB
LA_{eq}	54.2 dB
LC_{eq} - LA_{eq}	11.4 dB
LAI_{eq}	56.5 dB
LA_{eq}	54.2 dB
LAI_{eq} - LA_{eq}	2.3 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	54.2					
$L_{S(max)}$	72.9	2023/03/08 12:46:10				
$L_{S(min)}$	43.9	2023/03/08 12:53:40				
$L_{Peak(max)}$	87.9	2023/03/08 12:46:04				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.01	0.01	%
Projected Dose	0.45	0.45	%
TWA (Projected)	51.0	51.0	dB
TWA (t)	26.5	26.5	dB
Lep (t)	39.4	39.4	dB

Statistics

LAS 2.00	65.2	dB
LAS 5.00	54.9	dB
LAS 10.00	51.4	dB
LAS 25.00	49.4	dB
LAS 50.00	48.1	dB
LAS 90.00	45.6	dB

Summary

File Name on Meter	LxT_Data.026.s
File Name on PC	LxT_0001146-20230308 115155-LxT_Data.026.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S3
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 11:51:55
Stop	2023-03-08 12:31:13
Duration	00:30:34.6
Run Time	00:30:34.6
Pause	00:00:00.0
Pre-Calibration	2023-03-08 11:43:58
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.6 dB

	A	C	Z
Under Range Peak	**101.5**	98.5	103.5 dB
Under Range Limit	**38.7**	38.4	45.4 dB
Noise Floor	29.6	29.2	36.3 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LASeq	57.0 dB	
LASE	89.6 dB	
EAS	102.164 µPa²h	
EAS8	1.604 mPa²h	
EAS40	8.019 mPa²h	
LApeak (max)	2023-03-08 12:06:21	94.1 dB
LASmax	2023-03-08 12:06:21	77.6 dB
LASmin	2023-03-08 12:23:29	44.1 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	57.0	57.0	-99.9	57.0	57.0	-99.9

LCSeq	68.0 dB
LASeq	57.0 dB
LCSeq - LASeq	11.0 dB
LAleq	60.1 dB
LAeq	57.1 dB
LAleq - LAeq	3.0 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	57.1					
$L_{S(max)}$	77.6	2023/03/08 12:06:21				
$L_{S(min)}$	44.1	2023/03/08 12:23:29				
$L_{Peak(max)}$	94.1	2023/03/08 12:06:21				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.05	0.05	%
Projected Dose	0.74	0.74	%
TWA (Projected)	54.6	54.6	dB
TWA (t)	34.7	34.7	dB
Lep (t)	45.0	45.0	dB

Statistics

LAS 2.00	64.6	dB
LAS 5.00	61.1	dB
LAS 10.00	58.6	dB
LAS 25.00	54.6	dB
LAS 50.00	51.8	dB
LAS 90.00	47.6	dB

Summary

File Name on Meter	LxT_Data.029.s
File Name on PC	LxT_0001146-20230308 134425-LxT_Data.029.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S4
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 13:44:25
Stop	2023-03-08 14:04:28
Duration	00:20:03.4
Run Time	00:20:03.4
Pause	00:00:00.0
Pre-Calibration	2023-03-08 13:43:35
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.6 dB

	A	C	Z
Under Range Peak	**101.5**	98.5	103.5 dB
Under Range Limit	**38.7**	38.4	45.4 dB
Noise Floor	29.6	29.2	36.3 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{Seq}	57.3 dB	
LASE	88.1 dB	
EAS	71.807 µPa²h	
EAS8	1.719 mPa²h	
EAS40	8.593 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 13:51:09	83.4 dB
LAS_{max}	2023-03-08 13:52:35	69.1 dB
LAS_{min}	2023-03-08 14:01:09	46.5 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	57.3	57.3	-99.9	57.3	57.3	-99.9

LC_{Seq}	68.0 dB
LA_{Seq}	57.3 dB
LC_{Seq} - LA_{Seq}	10.7 dB
LAI_{eq}	58.9 dB
LA_{eq}	57.3 dB
LAI_{eq} - LA_{eq}	1.6 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	57.3					
$L_{S(max)}$	69.1	2023/03/08 13:52:35				
$L_{S(min)}$	46.5	2023/03/08 14:01:09				
$L_{Peak(max)}$	83.4	2023/03/08 13:51:09				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.04	0.04	%
Projected Dose	0.99	0.99	%
TWA (Projected)	56.7	56.7	dB
TWA (t)	33.8	33.8	dB
Lep (t)	43.5	43.5	dB

Statistics

LAS 2.00	64.0	dB
LAS 5.00	62.0	dB
LAS 10.00	59.8	dB
LAS 25.00	57.6	dB
LAS 50.00	55.8	dB
LAS 90.00	52.3	dB

Summary

File Name on Meter	LxT_Data.038.s
File Name on PC	LxT_0001146-20230308 101634-LxT_Data.038.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S5
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 10:16:34
Stop	2023-03-08 10:32:34
Duration	00:16:00.6
Run Time	00:16:00.6
Pause	00:00:00.0
Pre-Calibration	2023-03-08 10:15:01
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

	A	C	Z
Under Range Peak	**101.1**	98.1	103.1 dB
Under Range Limit	**38.3**	38.0	45.0 dB
Noise Floor	29.2	28.8	35.9 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{eq}	48.9 dB	
LASE	78.7 dB	
EAS	8.285 µPa²h	
EAS8	248.399 µPa²h	
EAS40	1.242 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 10:32:16	74.3 dB
LAS_{max}	2023-03-08 10:30:26	56.3 dB
LAS_{min}	2023-03-08 10:16:34	40.9 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	48.9	48.9	-99.9	48.9	48.9	-99.9

LC_{eq}	60.7 dB
LA_{eq}	48.9 dB
LC_{eq} - LA_{eq}	11.8 dB
LAI_{eq}	50.5 dB
LA_{eq}	48.9 dB
LAI_{eq} - LA_{eq}	1.6 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	48.9					
$L_{S(max)}$	56.3	2023/03/08 10:30:26				
$L_{S(min)}$	40.9	2023/03/08 10:16:34				
$L_{Peak(max)}$	74.3	2023/03/08 10:32:16				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.01	0.01	%
Projected Dose	0.32	0.32	%
TWA (Projected)	48.5	48.5	dB
TWA (t)	24.0	24.0	dB
Lep (t)	34.1	34.1	dB

Statistics

LAS 2.00	54.1	dB
LAS 5.00	53.0	dB
LAS 10.00	51.9	dB
LAS 25.00	49.7	dB
LAS 50.00	47.7	dB
LAS 90.00	44.8	dB

Summary

File Name on Meter	LxT_Data.031.s
File Name on PC	LxT_0001146-20230308 151717-LxT_Data.031.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S6
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 15:17:17
Stop	2023-03-08 15:33:18
Duration	00:16:01.0
Run Time	00:16:01.0
Pause	00:00:00.0
Pre-Calibration	2023-03-08 15:15:45
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.4 dB

	A	C	Z
Under Range Peak	**101.3**	98.3	103.3 dB
Under Range Limit	**38.5**	38.2	45.3 dB
Noise Floor	29.4	29.0	36.1 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{eq}	61.1 dB	
LASE	90.9 dB	
EAS	137.556 µPa²h	
EAS8	4.122 mPa²h	
EAS40	20.612 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 15:20:04	83.6 dB
LAS_{max}	2023-03-08 15:20:05	69.8 dB
LAS_{min}	2023-03-08 15:24:26	44.0 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	61.1	61.1	-99.9	61.1	61.1	-99.9

LC_{eq}	71.8 dB
LA_{eq}	61.1 dB
LC_{eq} - LA_{eq}	10.7 dB
LAI_{eq}	62.1 dB
LA_{eq}	61.1 dB
LAI_{eq} - LA_{eq}	1.0 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	61.1					
$L_{S(max)}$	69.8	2023/03/08 15:20:05				
$L_{S(min)}$	44.0	2023/03/08 15:24:26				
$L_{Peak(max)}$	83.6	2023/03/08 15:20:04				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.06	0.06	%
Projected Dose	1.70	1.70	%
TWA (Projected)	60.6	60.6	dB
TWA (t)	36.1	36.1	dB
Lep (t)	46.3	46.3	dB

Statistics

LAS 2.00	66.3	dB
LAS 5.00	64.6	dB
LAS 10.00	63.5	dB
LAS 25.00	62.0	dB
LAS 50.00	60.4	dB
LAS 90.00	55.5	dB

Summary

File Name on Meter	LxT_Data.030.s
File Name on PC	LxT_0001146-20230308 145711-LxT_Data.030.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S7
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 14:57:11
Stop	2023-03-08 15:12:29
Duration	00:15:17.6
Run Time	00:15:17.6
Pause	00:00:00.0
Pre-Calibration	2023-03-08 14:56:08
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.4 dB

	A	C	Z
Under Range Peak	**101.3**	98.3	103.3 dB
Under Range Limit	**38.5**	38.1	45.2 dB
Noise Floor	29.3	29.0	36.1 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{Seq}	51.6 dB	
LASE	81.2 dB	
EAS	14.737 µPa²h	
EAS8	462.541 µPa²h	
EAS40	2.313 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 15:06:34	83.1 dB
LAS_{max}	2023-03-08 15:08:57	63.3 dB
LAS_{min}	2023-03-08 14:59:21	43.6 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	51.6	51.6	-99.9	51.6	51.6	-99.9

LC_{Seq}	63.9 dB
LA_{Seq}	51.6 dB
LC_{Seq} - LA_{Seq}	12.3 dB
LAI_{eq}	54.0 dB
LA_{eq}	51.6 dB
LAI_{eq} - LA_{eq}	2.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	51.6					
$L_{S(max)}$	63.3	2023/03/08 15:08:57				
$L_{S(min)}$	43.6	2023/03/08 14:59:21				
$L_{Peak(max)}$	83.1	2023/03/08 15:06:34				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.01	0.01	%
Projected Dose	0.46	0.46	%
TWA (Projected)	51.2	51.2	dB
TWA (t)	26.3	26.3	dB
Lep (t)	36.6	36.6	dB

Statistics

LAS 2.00	57.2	dB
LAS 5.00	55.7	dB
LAS 10.00	54.0	dB
LAS 25.00	51.9	dB
LAS 50.00	50.5	dB
LAS 90.00	47.9	dB

Summary

File Name on Meter	LxT_Data.034.s
File Name on PC	LxT_0001146-20230308 165758-LxT_Data.034.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	S8
Location	Reche Canyon Road
Job Description	
Note	

Measurement

Description	
Start	2023-03-08 16:57:58
Stop	2023-03-08 17:13:56
Duration	00:15:58.3
Run Time	00:15:58.3
Pause	00:00:00.0
Pre-Calibration	2023-03-08 16:54:13
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.4 dB

	A	C	Z
Under Range Peak	**101.3**	98.3	103.3 dB
Under Range Limit	**38.5**	38.2	45.2 dB
Noise Floor	29.4	29.0	36.1 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{Seq}	53.6 dB	
LASE	83.4 dB	
EAS	24.393 µPa²h	
EAS8	733.077 µPa²h	
EAS40	3.665 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 17:11:18	96.3 dB
LAS_{max}	2023-03-08 17:03:41	66.3 dB
LAS_{min}	2023-03-08 16:57:58	46.4 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	53.6	53.6	-99.9	53.6	53.6	-99.9

LC_{Seq}	66.8 dB
LA_{Seq}	53.6 dB
LC_{Seq} - LA_{Seq}	13.2 dB
LAI_{eq}	57.3 dB
LA_{eq}	53.6 dB
LAI_{eq} - LA_{eq}	3.7 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	53.6					
$L_{S(max)}$	66.3	2023/03/08 17:03:41				
$L_{S(min)}$	46.4	2023/03/08 16:57:58				
$L_{Peak(max)}$	96.3	2023/03/08 17:11:18				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.02	0.02	%
Projected Dose	0.56	0.56	%
TWA (Projected)	52.6	52.6	dB
TWA (t)	28.1	28.1	dB
Lep (t)	38.8	38.8	dB

Statistics

LAS 2.00	61.3	dB
LAS 5.00	59.2	dB
LAS 10.00	57.2	dB
LAS 25.00	53.4	dB
LAS 50.00	49.9	dB
LAS 90.00	48.3	dB

Summary

File Name on Meter	LxT_Data.036.s
File Name on PC	LxT_0001146-20230308 181632-LxT_Data.036.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S10
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 18:16:32
Stop	2023-03-08 18:30:07
Duration	00:13:35.8
Run Time	00:00:00.7
Pause	00:13:35.1
Pre-Calibration	2023-03-08 18:15:49
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.4 dB

	A	C	Z
Under Range Peak	**101.3**	98.3	103.3 dB
Under Range Limit	**38.5**	38.1	45.2 dB
Noise Floor	29.4	29.0	36.1 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{Seq}	46.7 dB	
LASE	45.2 dB	
EAS	0.004 µPa²h	
EAS8	149.675 µPa²h	
EAS40	748.376 µPa²h	
$LA_{peak\ (max)}$	2023-03-08 18:16:32	-99.9 dB
LAS_{max}	2023-03-08 18:16:32	47.1 dB
LAS_{min}	2023-03-08 18:16:32	45.3 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	46.7	46.7	-99.9	46.7	46.7	-99.9

LC_{Seq}	56.6 dB
LA_{Seq}	46.7 dB
LC_{Seq} - LA_{Seq}	9.9 dB
LAI_{eq}	46.8 dB
LA_{eq}	45.4 dB
LAI_{eq} - LA_{eq}	1.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	45.4					
$L_{S(max)}$	47.1	2023/03/08 18:16:32				
$L_{S(min)}$	45.3	2023/03/08 18:16:32				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.00	0.00	%
Projected Dose	0.25	0.25	%
TWA (Projected)	46.7	46.7	dB
TWA (t)	-29.9	-29.9	dB
Lep (t)	0.6	0.6	dB

Statistics

LAS 2.00	47.1	dB
LAS 5.00	47.1	dB
LAS 10.00	47.0	dB
LAS 25.00	46.8	dB
LAS 50.00	46.6	dB
LAS 90.00	46.4	dB

Summary

File Name on Meter	LxT_Data.040.s
File Name on PC	LxT_0001146-20230308 113814-LxT_Data.040.ldbin
Serial Number	0001146
Model	SoundTrack LxT®
Firmware Version	2.403
User	
Location	S11
Job Description	Reche Canyon Road
Note	

Measurement

Description	
Start	2023-03-08 11:38:14
Stop	2023-03-08 11:54:17
Duration	00:16:02.5
Run Time	00:16:02.5
Pause	00:00:00.0
Pre-Calibration	2023-03-08 11:37:41
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

	A	C	Z
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**38.3**	38.0	45.1 dB
Noise Floor	29.2	28.9	35.9 dB

	First	Second	Third
Instrument Identification	Urban Crossroads	1001 Dove Street, Suite 260	Newport Beach, CA 92660

Results

LA_{eq}	50.1 dB	
LASE	79.9 dB	
EAS	10.944 µPa²h	
EAS8	327.454 µPa²h	
EAS40	1.637 mPa²h	
$LA_{peak\ (max)}$	2023-03-08 11:47:19	80.7 dB
LAS_{max}	2023-03-08 11:44:19	61.5 dB
LAS_{min}	2023-03-08 11:51:39	44.0 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LA_{peak} > 135.0 dB	0	0.0 s
LA_{peak} > 137.0 dB	0	0.0 s
LA_{peak} > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	50.1	50.1	-99.9	50.1	50.1	-99.9

LC_{eq}	63.3 dB
LA_{eq}	50.1 dB
LC_{eq} - LA_{eq}	13.2 dB
LAI_{eq}	53.5 dB
LA_{eq}	50.1 dB
LAI_{eq} - LA_{eq}	3.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	50.1					
$L_{S(max)}$	61.5	2023/03/08 11:44:19				
$L_{S(min)}$	44.0	2023/03/08 11:51:39				
$L_{Peak(max)}$	80.7	2023/03/08 11:47:19				

Overload Count	0	
Overload Duration	0.0	s
OBA Overload Count	0	
OBA Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.01	0.01	%
Projected Dose	0.36	0.36	%
TWA (Projected)	49.4	49.4	dB
TWA (t)	24.9	24.9	dB
Lep (t)	35.3	35.3	dB

Statistics

LAS 2.00	57.7	dB
LAS 5.00	55.1	dB
LAS 10.00	53.3	dB
LAS 25.00	49.6	dB
LAS 50.00	47.8	dB
LAS 90.00	45.4	dB