

APPENDIX F

Noise and Vibration Study

Technical Memorandum

TO: Cristina Lowery
Michael Baker International, Inc.

FROM: Terry A. Hayes Associates Inc.

DATE: September 25, 2025

RE: **Granada Trunk Line Replacement Project – Noise and Vibration Study**

Introduction

Terry A. Hayes Associates Inc. (TAHA) has completed a Noise and Vibration Study (Study) for the Los Angeles Department of Water and Power (LADWP) Granada Trunk Line (GTL) Replacement Project (proposed project) in accordance with the provisions of the California Environmental Quality Act (CEQA) Statutes and Guidelines. This Study is organized as follows:

- Introduction
- Project Description
- Noise and Vibration Topical Information
- Existing Setting
- Regulatory Framework
- Significance Thresholds
- Methodology
- Impact Assessment
- References

Project Description

The LADWP proposes replacing Units 1 and 2 of the GTL to increase safety and reliability; to allow for greater operational flexibility for the West Valley area of the City and the De Soto Reservoir; and to convey future local water supplies while reducing dependence on imported water. The proposed project would include the replacement of an approximately 13,228-foot portion of the GTL within the Rinaldi Street right-of-way (ROW) between Balboa Boulevard and Yolanda Avenue (Unit 1), and an approximately 13,183-foot portion of the GTL between Yolanda Avenue and the De Soto Reservoir Regulator Station (Unit 2), with a new 48-inch diameter Earthquake Resistant Ductile Iron Pipe. The replacement pipe would be installed within the Rinaldi Street ROW, generally parallel to the existing trunk line approximately 900 feet north of the existing alignment. At its eastern terminus, the GTL would tie into the existing GTL at Balboa Avenue and Rinaldi Street. At its western terminus, the proposed GTL replacement would tie into the existing De Soto Reservoir Regulator Station, located near the intersection of De Soto Avenue and Rinaldi Street. The existing GTL would be abandoned in place.

The proposed project is located within the Granada Hills – Knollwood and Chatsworth – Porter Ranch community plan areas, specifically within the Granada Hills and Porter Ranch neighborhoods, within the City of Los Angeles. The eastern terminus of the replacement pipe is located approximately 21 miles northwest of downtown Los Angeles. The replacement pipe would extend along Rinaldi Street, within the public ROW, from Balboa Boulevard in Granada Hills to approximately 500 feet east of De Soto Avenue, at the De Soto Reservoir, in Porter Ranch. **Figure 1** shows the regional vicinity and **Figure 2** shows the project location. **Figures 3** and **4** show the project alignment.

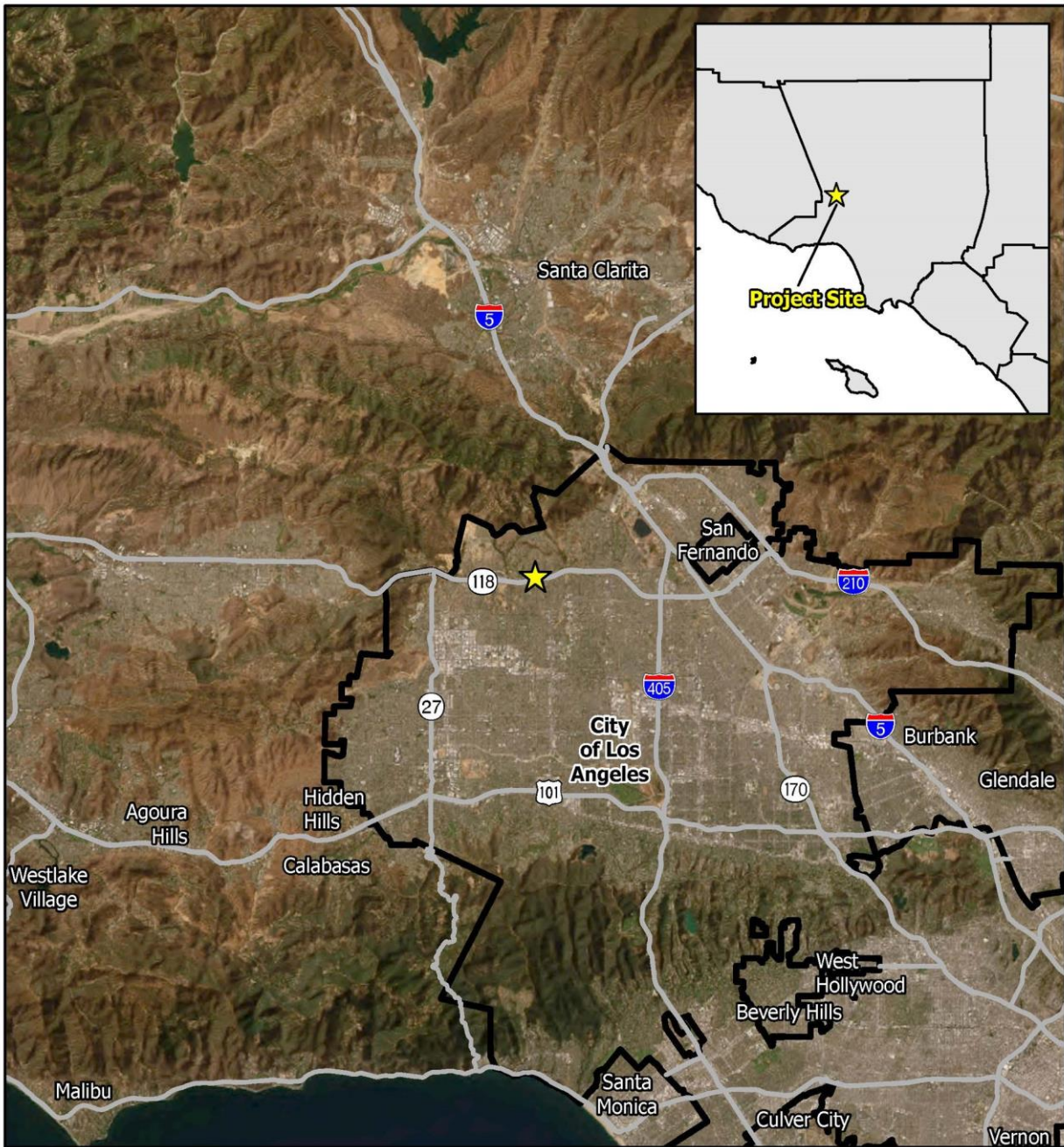
CONSTRUCTION

Construction of Unit 1 is planned to commence in July 2028 and conclude in July 2036. Construction of Unit 2 is planned to commence in September 2030 and conclude in March 2038. Construction would occur between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday. Nighttime work may be needed during construction that requires crossing a major street. This would require a permit to extend construction activities beyond regular daytime hours. The open trench construction would progress along the alignment at a rate of approximately 40 linear feet of pipeline installation per day, with a maximum of 500 feet of open trench along the roadway at any time. Pipe jacking would progress along the pipe jacking locations at a rate of approximately 9 to 10 linear feet per day after the pits are constructed. The existing trunk line would be abandoned and left in place; however, it would remain in service during construction. As such, interruptions in water service would not occur during the construction process.

Construction would typically involve two crews of approximately eight workers each. Approximately 800,000 square feet of roadway would be excavated and repaved. The total estimated amount of excavation would be approximately 75,000 cubic yards, and the total export would be approximately 100,000 cubic yards. A total of approximately 75,000 cubic yards of slurry would be imported throughout the construction process for use as backfill. Daily vehicular trips throughout construction would include a maximum of 10 round trips per day for transportation of construction equipment to and from the work areas; approximately 25 round trips per day for transportation of construction workers to and from the work areas (two crews); and 20 round trips per day for haul trucks transporting materials including the import of cement-slurry (i.e., dump trucks). Partial lane closures would be necessary for installing the new pipeline and its appurtenances. Construction equipment and materials may be stored at off-site staging areas; however, staging areas would be located adjacent or near the construction areas.

OPERATIONS

The replacement pipeline is anticipated to have an operational life of 100 years, and the replacement valves are anticipated to have an operational life of 70 years. The entire trunk line would be located underground and would not be visible during operations. The GTL would remain pressurized at all times to supply water to the surrounding service area. Connections to various trunk lines would be opened as necessary to support the water transmission system. These functions would not require any additional supplies from the City's drinking water system. Operational activities would be limited to scheduled maintenance and emergency repair. Maintenance activities would be minimal and would be similar to those that occur under existing conditions, including exercising valves and replacing or repairing worn appurtenances to ensure proper performance over the life of the facilities. No permanent workers would be required to operate or maintain the GTL.



Legend



Project Site



City of Los Angeles Boundary

GRANADA TRUNK LINE REPLACEMENT PROJECT

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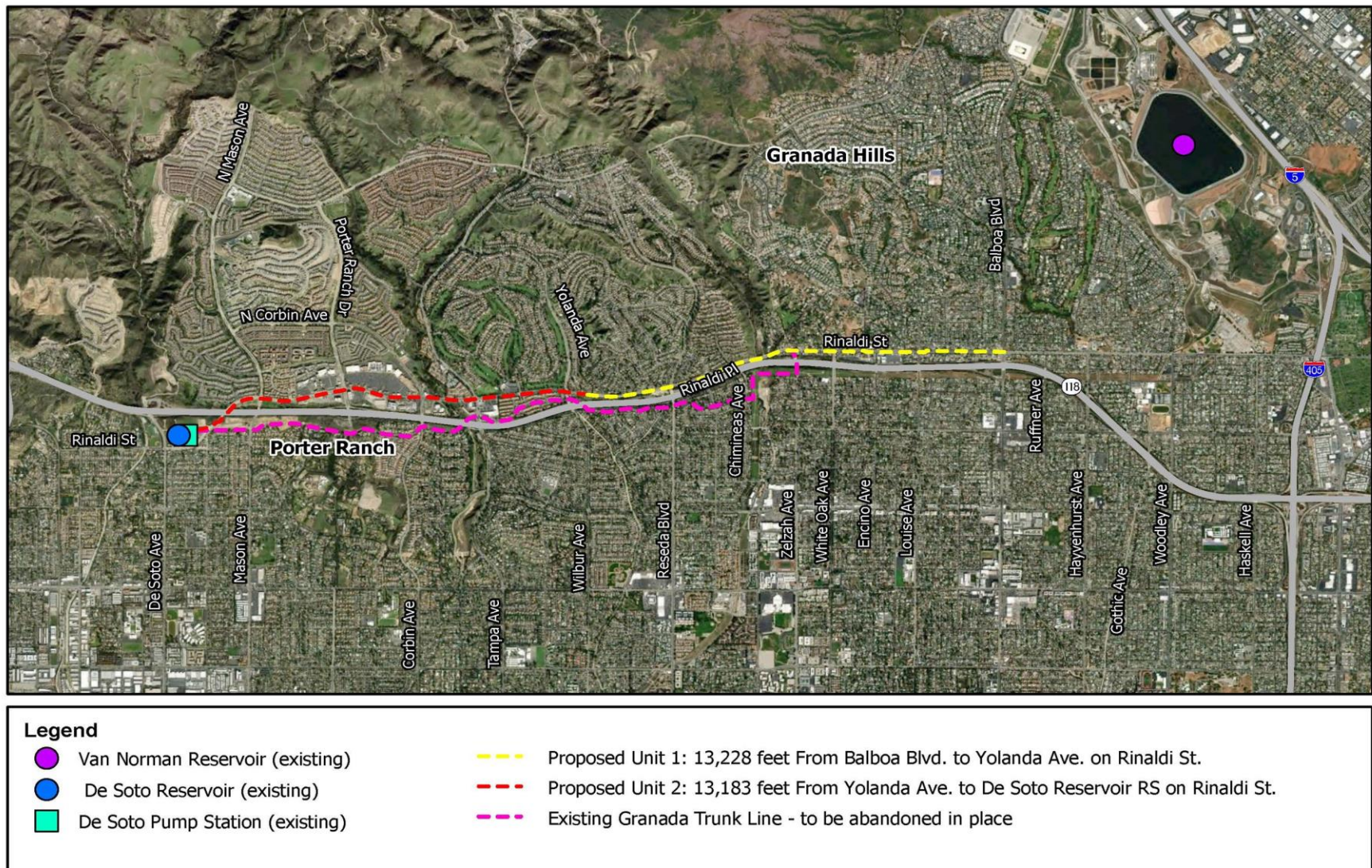


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Source: Esri, ArcGIS Online, County of Los Angeles

Regional Vicinity Map

Figure 1





Legend

- Proposed Pipe Jacking Location: Rinaldi St. and Reseda Blvd
- Proposed Unit 1 Alignment
- Proposed Unit 2 Alignment
- Existing Granada Trunk Line - to be abandoned in place

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Source: Esri, ArcGIS Online, County of Los Angeles

GRANADA TRUNK LINE REPLACEMENT PROJECT

Proposed Project Alignment - Unit 1

Figure 3



Legend

- De Soto Pump Station (existing)
- De Soto Reservoir (existing)
- Proposed Pipe Jacking Locations: Rinaldi St. and Porter Ranch Dr., Rinaldi St. and Corbin Ave., Rinaldi St. and Tampa Ave., Rinaldi St. and SR-118

- Proposed Unit 1 Alignment
- Proposed Unit 2 Alignment
- Existing Granada Trunk Line - to be abandoned in place

Noise and Vibration Topical Information

The standard unit of measurement for noise is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The A-weighted scale, abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. This noise analysis discusses sound levels in terms of Equivalent Noise Level (L_{eq}), Community Noise Equivalent Level (CNEL), and Maximum Noise Level (L_{max}). L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single-event duration, single-event occurrence, frequency and time of day. Due to the lower background noise level, human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually 5 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m. Because CNEL accounts for human sensitivity to sound, CNEL is always a higher number than the actual 24-hour average sound level. L_{max} is the maximum, instantaneous noise level experienced during a given period of time. This descriptor is often referred to as the “peak noise level”. Typically noise levels in L_{max} are used as reference noise levels to calculate L_{eq} or CNEL.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” decreases by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level is 83 dBA at a distance of 100 feet from the noise source, and 77 dBA at a distance of 200 feet over a hard surface.

Noise generated by a mobile source (e.g., vehicle on the roadway network) decreases by approximately 3 dBA over hard surfaces and 4.8 dBA over soft surfaces for each doubling of the distance. Generally, noise is most audible when the source is in a direct line-of-sight of the receiver. Solid barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier. However, if a barrier is not sufficiently high or long to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as rock blasting, pile driving, and heavy earth-moving equipment. High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes).

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The VdB acts to compress the range of numbers required to describe vibration.¹

Existing Setting

NOISE

To characterize the existing noise environment in the vicinity of proposed project, ambient noise was monitored using a SoundPro DL Sound Level Meter on September 22, 2025, from 10:30 a.m. to 2:30 p.m. in 15-minute timespans. This time of day represents a typical construction time without the added noise source of peak hour traffic. Monitored noise levels ranged from 50.4 to 71.8 dBA, L_{eq} . The monitoring locations are shown in **Figures 5 and 6** and monitored noise levels are shown in **Table 1**.

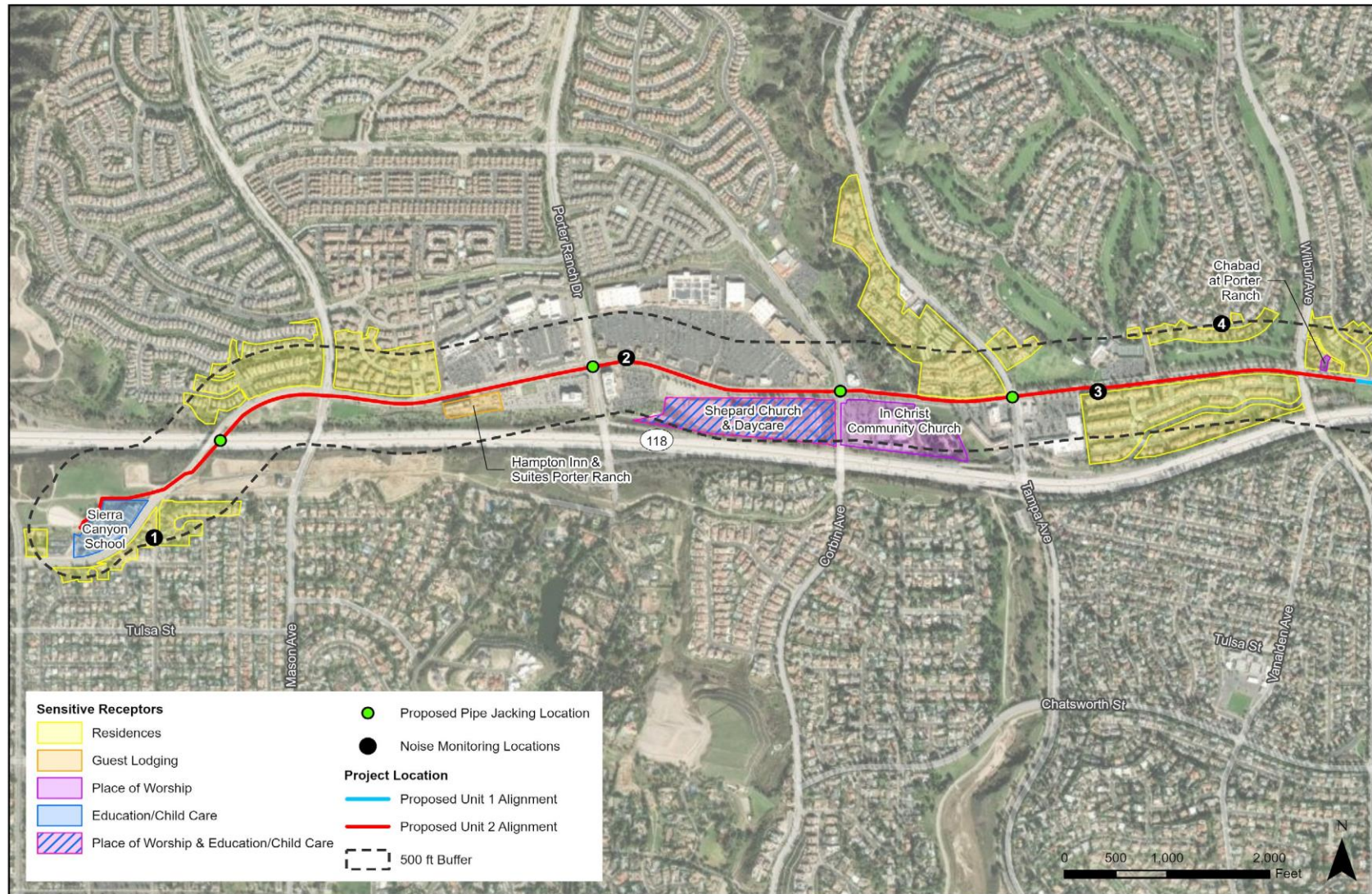
TABLE 1: EXISTING AMBIENT NOISE LEVELS AT MONITORING LOCATIONS		
Noise Monitoring Site	Noise Monitoring Location	Noise Level (dBA, L_{eq})
1	Residence (11015 Lurline Ave.)	50.4
2	Rinaldi St. and Porter Ranch Dr.	69.3
3	Residence (11257 Key W. Ave.)	71.8
4	Residence (11331 Pala Mesa Dr.)	56.5
5	Rinaldi St. and Reseda Blvd.	69.4
6	Residence (18218 Bathurst St.)	53.1
7	Rinaldi Adult Center (17450 Rinaldi St.)	69.6
8	Residence (17185 Flanders St.)	53.5
SOURCE: TAHA, 2025.		

VIBRATION

Existing sources of vibration include passenger vehicles and trucks traveling along roadways in the surrounding area. Vibration generated by vehicular traffic is not typically perceptible outside the roadway ROW due to vibration dampening of rubber tires and vehicle suspension systems. The project site does not include significant sources of vibration.

¹Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.





Source: ESRI, 2025. Michael Baker International, Inc., 2025. TAHA, 2025.



GRANADA TRUNK LINE REPLACEMENT PROJECT
 NOISE AND VIBRATION STUDY

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Noise Monitoring Locations and Sensitive Receptors - Unit 2
 Figure 6

SENSITIVE RECEPTORS

Sensitive receptors are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land, and typically include residences, schools, parks, and recording studios. Parks with active uses (e.g., baseball fields, tennis courts) are not considered sensitive to noise. Los Angeles Municipal Code (LAMC) Sections 41.40 and 112.05 indicate that 500 feet is an appropriate screening distance for assessing construction-related noise impacts in an urban environment. As shown in **Figure 5** and **Figure 6**, sensitive receptors located within 500 feet of the proposed construction activities include, but are not limited to:

- Sierra Canyon School
- Hampton Inn & Suites
- Shepherd Church and Daycare
- In Christ Community Church
- Chabad at Porter Ranch
- Temple Ahavat Shalom
- Inspire Learning Center
- Granada Hills Kindercare
- Islamic Center of Northridge, Granada Hills Masjid
- Serenity Kids Academy
- Heritage Christian School/Church
- Living Water Church
- Rinaldi Adult Center

Regulatory Framework

NOISE

Federal. The Noise Control Act of 1972 established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, the United States Environmental Protection Agency (USEPA) determined that subjective issues such as noise would be better addressed at local levels of government, thereby allowing more individualized control for specific issues by designated federal, state, and local government agencies. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to specific federal agencies, and state and local governments. However, noise control guidelines and regulations contained in the USEPA rulings in prior years remain in place.

State. The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles and occupational noise control are not applicable to planning efforts, nor are these areas typically subject to CEQA analysis.

The California Department of Transportation (Caltrans) has published guidance for assessing roadway noise.² The guidance includes Noise Abatement Criteria (NAC), which are used to identify potential impacts. The exterior NAC for land uses such as residences, schools, and parks is 67 dBA L_{eq} . The exterior NAC for motels and other commercial land uses is 72 dBA L_{eq} . In California, a noise level is considered to approach the NAC for a given activity category if it is within 1 dBA of the NAC. In addition, Caltrans

²California Department of Transportation, *Traffic Noise Analysis Protocol*, April 2020.

guidance states that a substantial noise increase is considered to occur when project-related hourly noise levels exceed existing hourly noise levels by 12 dBA or more. The use of 12 dB was established in California many years ago and is based on the concept that a 10 dB increase generally is perceived as a doubling of loudness.

Local. The City of Los Angeles has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. Regarding construction, LAMC Section 41.40 (Noise Due to Construction, Excavation Work – When Prohibited) states that no construction or repair work shall be performed between the hours of 9:00 p.m. and 7:00 a.m. on Monday through Friday since such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment, or other place of residence. Further, no person, other than an individual homeowner engaged in the repair or construction of his/her single-family dwelling, shall perform any construction or repair work of any kind or perform such work within 500 feet of land before 8:00 a.m. or after 6:00 p.m. on any Saturday, nor at any time on any Sunday or on a federal holiday.

LAMC Section 91.106.4.8 (Construction Site Notice) requires a construction site notice to be posted that includes the following information: job site address, permit number, name and phone number of the contractor and owner or owner's agent, hours of construction allowed by code or any discretionary approval for the site, and City telephone numbers where violations can be reported. The notice shall be posted and maintained at the construction site prior to the start of construction and displayed in a location that is readily visible to the public.

LAMC Section 112.02 (Air Conditioning, Refrigeration, Heating, Pumping, Filtering Equipment) limits increases in noise levels from air conditioning, refrigeration, heating, pumping and filtering equipment. Such equipment may not be operated in such manner as to create any noise which would cause the noise level on the premises of any other occupied property, or, if a condominium, apartment house, duplex, or attached business, within any adjoining unit, to exceed the ambient noise level by more than 5 dB.

LAMC Section 112.04 (Powered Equipment Intended for Repetitive Use in Residential Areas and Other Machinery, Equipment, and Devices) specifies that no person shall operate any lawn mower, backpack blower, lawn edger, riding tractor, or any other machinery, equipment, or other mechanical or electrical device, or any hand tool which creates a loud, raucous or impulsive sound, within any residential zone or within 500 feet of a residence between the hours of 10:00 p.m. and 7:00 a.m. of the following day.

LAMC Section 116.01 (Loud, Unnecessary, and Unusual Noise) states that it shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary, and unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

In addition to the LAMC, the Noise Element of the General Plan includes noise compatibility guidelines. These guidelines may be used to assess potential effects of new projects to the local community. The Noise Compatibility Guidelines are shown in **Table 2**.

TABLE 2: GUIDELINES FOR NOISE COMPATIBLE LAND USE

Land Use Category	Community Noise Exposure (dBA, CNEL)					
	55	60	65	70	75	80
Residential - Low Density Single-Family, Duplex, Mobile Homes						
Residential - Multi-Family						
Transient Lodging - Motels Hotels						
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheaters						
Sports Arena, Outdoor Spectator Sports						
Playgrounds, Neighborhood Parks						
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Business Commercial and Professional						
Industrial, Manufacturing, Utilities, Agriculture						

Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.

Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable - New construction or development should generally not be undertaken.

SOURCE: California Office of Noise Control, Department of Health Services.

VIBRATION

Federal. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guidance includes criteria for assessing potential human annoyance due to vibration by land use category. The threshold of each category depends on the number of daily events, with an “event” defined by FTA guidance as a pass-by of a vehicle (train, bus or car). The three different event categories are infrequent events (fewer than 30 events per day), occasional events (30 to 70 events per day), and frequent events (more than 70 events per day). **Table 3** shows the vibration annoyance criteria by land use and frequency of event.

TABLE 3: CONSTRUCTION EQUIPMENT VIBRATION LEVELS			
Land Use category	Groundborne Vibration Impact Levels (VdB micro/inch per second)		
	Frequent Events	Occasional Events	Infrequent Events
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB /a/	65 VdB /a/	65 VdB /a/
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime uses.	75 VdB	78 VdB	83 VdB
/a/ This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a Detailed Vibration Analysis must be performed.			
SOURCE: Federal Transit Administration, <i>Transit Noise and Vibration Impact Assessment</i> , September 2018.			

Significance Thresholds

CEQA STATUTE AND GUIDELINES

This Study was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts related to noise and vibration in the context of the Appendix G Environmental Checklist criteria of the CEQA Statute and Guidelines. Implementation of the proposed project may result in a significant impact related to noise or vibration if it would:

- Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in generation of excessive ground-borne vibration or ground-borne noise levels; and/or
- Expose people residing or working in the project area to excessive noise levels for a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

CITY OF LOS ANGELES SIGNIFICANCE THRESHOLDS

The City of Los Angeles adopted new construction-related noise and vibration significance thresholds in August 2024. The updated significance thresholds relevant to the proposed project are shown below, along with the previously adopted operational significance thresholds.

NOISE

Construction. For construction activities that occur between 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturdays, there is no numerical threshold above ambient noise levels. The proposed project would not include nighttime construction. Accordingly, only the daytime significance threshold related to absolute noise is included in this analysis. The proposed project would result in a significant impact related to construction noise if:

- On- and off-site construction noise during daytime hours (7:00 a.m. and 7:00 p.m. Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturdays) would exceed 80 dBA, L_{eq} (8-hour) at sensitive uses (at the property line or at the exterior of the building), including outdoor public recreational areas owned or maintained by a public agency. This significance threshold does not apply to private residential balconies which may or may not extend past the exterior of a building, or to private residential recreational areas.

Operations. The proposed project would exceed local standards and significantly increase permanent noise levels if:

- Permanent ambient noise level measured at the property line of affected uses increases by 3 dBA CNEL or to within the Normally Unacceptable or Clearly Unacceptable categories, as shown in **Table 2**, or any 5 dBA CNEL or more increase in noise level.
- Mechanical equipment (Air Conditioning, Pumping, Filtering Equipment) would cause the noise level on the premises of any other occupied property to exceed the ambient noise level by more than 5 dBA.

VIBRATION

Construction. For construction activities that occur between 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturdays, there is no numerical threshold related to human annoyance. The proposed project would not include nighttime construction. Accordingly, only the significance thresholds related to building damage are relevant to the proposed project. The proposed project would result in a significant construction vibration impact if:

- Vibration levels would exceed 0.1 inches per second PPV at fragile buildings. Fragile Buildings are buildings which are extremely susceptible to vibration damage and would include, but not be limited to, existing unreinforced masonry buildings, existing wood-frame multi-story buildings with soft, weak or open front walls, and existing non-ductile concrete buildings.
- Vibration levels would exceed 0.25 inches per second PPV at historic buildings. Historic Buildings are buildings which are considered potential historic resources pursuant to CEQA.
- Vibration levels would exceed 0.3 inches per second PPV at older residential structures 50 years old or more.
- Vibration levels would exceed 0.5 inches per second PPV at new residential structures and modern industrial/commercial buildings less than 50 years old.

Operations. The operational-related vibration analysis considers the potential for annoyance. Maximum vibration levels were assessed based on infrequent vibration events happening fewer than 30 times in one day, which would be consistent with operations. The proposed project would result in a significant operational vibration impact if:

- Vibration levels would exceed 80 VdB at residences and buildings where people normally sleep.
- Vibration levels would exceed 83 VdB at institutional land uses with primary daytime use.

Methodology

NOISE

Construction. Noise levels associated with typical construction equipment were obtained from the Federal Highway Administration Roadway Construction Noise Model (RCNM).³ This model predicts noise from construction based on a compilation of empirical data and the application of acoustical propagation formulas. Maximum equipment noise levels were adjusted based on anticipated percentage of use. Combined construction activity noise levels were estimated by combining anticipated equipment for each activity using RCNM. The projected noise level during the construction period at receptors was calculated by using formula (1) which includes equipment usage, distance, and ground factor adjustments to the construction source sound level. Formula (2) is used to calculate the individual noise level for the loudest piece of construction equipment, which is the same as formula (1), but with an additional adjustment for time usage over 8-hours. The noise level from formula (1) and formula (2) were then combined using formula (3) to generate a combined construction noise level, which is the logarithmic sum of the construction equipment noise levels.

$$(1) L_{eq(8-hour)} = L_{max \text{ at } 50 \text{ feet}} - 20\log(D/50) + 10\log(UF) + 10G\log(D/50)$$

Where:

- $L_{eq(8-hour)}$ = calculated noise level, $L_{eq(8-hr)}$, at a receptor from the operation of a single piece of equipment, dBA.
- $L_{max \text{ at } 50 \text{ feet}}$ = noise emission level of the construction equipment at the reference distance of 50 feet, dBA (from Table 1).
- D = distance from the receptor to the construction equipment, feet. To represent the average construction noise level, as construction equipment would move around the project site, the distance (D) is from the approximate center of the project site to the receptor location (maximum 500 feet from the interior of the project site).
- UF = usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.
- G = a constant that accounts for topography and ground effects. For general assessment, assumed $G = 0$ assuming free-field conditions and without ground effects. If ground effects are of specific importance, use the FTA procedure for calculating G .

$$(2) L_{eq(8-hr)} = L_{max \text{ at } 50 \text{ feet}} - 20\log(D/50) + 10\log(UF) + 10\log(T/8) + 10G\log(D/50)$$

Where:

- $L_{eq(8-hr)}$ = calculated noise level, $L_{eq(8-hr)}$, at a receptor from the operation of a single loudest piece of equipment, dBA.
- $L_{max \text{ at } 50 \text{ feet}}$ = noise emission level of the construction equipment at the reference distance of 50 feet, dBA.
- D = distance from the receptor to the construction equipment, feet.
- UF = usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

³Federal Highway Administration, *Roadway Construction Noise Model*, Version 1.1, August 2008.

T = number of hours (within an 8-hour period) that the loudest equipment would be operating at the distance “D” above.

G = a constant that accounts for topography and ground effects.

$$(3) L_{eq(8-hr)} total = 10 \log [\sum all sources 10L_{eq(8-hr)}/10]$$

Where:

$L_{eq(8-hr)} total$ = Logarithmic sum of all noise sources over the 8-hour period.

Haul truck noise was assessed qualitatively based upon the potential for the proposed project to double traffic volumes. The potential for a traffic noise impact was analyzed using guidance from the Caltrans, which states that a doubling of traffic would be necessary for an audible increase along a roadway to result. Expected traffic volumes generated by the proposed project were compared against existing traffic volumes on nearby roads documented by the Los Angeles Department of Transportation.

Operations. Implementation of the proposed project would not introduce a new substantial source of noise. Operations would remain similar to existing conditions. Therefore, noise impacts associated with the future operation of the proposed project are addressed qualitatively.

VIBRATION

Construction. Vibration levels were estimated using example vibration levels and propagation formulas provided by FTA.⁴ The methodology and formulas obtained from the FTA’s Transit Noise and Vibration Assessment guidance can be viewed below. Vibration damage is assessed using formula (4) and vibration annoyance is assessed using formula (5).

$$(4) \text{ Vibration Damage Attenuation Formula: } PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Where:

PPV_{equip} = Peak particles velocity in inches per second of the equipment adjusted for distance

PPV_{ref} = Reference vibration level in inches per second at 25 feet

D = Distance from the equipment to the receptor in feet

$$(5) \text{ Vibration Annoyance Attenuation Formula: } Lv_{equip} = Lv_{ref} - 30 \times \text{LOG} (D/25)$$

Where:

Lv_{equip} = Vibration level in vibration decibels of equipment adjusted for distance

Lv_{ref} = Reference vibration level in vibration decibels at 25 feet

D = Distance from the equipment to the receptor in feet

⁴Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

Operations. Implementation of the proposed project would not introduce a new substantial source of vibration. Operations would remain similar to existing conditions. Therefore, vibration impacts associated with the future operation of the proposed project are addressed qualitatively.

Impact Assessment

- a) Would the proposed project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Less-Than-Significant Impact with Mitigation Incorporated)*

Construction

Noise impacts from construction of the proposed project would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers (including natural topographic features). Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels from various types of equipment that would be used during construction are listed in **Table 4**. Noise levels from individual pieces of equipment typically are between 74.0 and 89.6 dBA L_{max} at 50 feet.

TABLE 4: CONSTRUCTION EQUIPMENT NOISE LEVELS	
Construction Equipment	Noise Level at 50 feet (dBA, L_{max})
Air compressor	77.7
Backhoe	72.6
Blower	77.7
Crane	75.6
Excavator	75.7
Forklift	78.4
Front-end loader	74.1
Generator	80.6
High-pressure water pump	80.9
Lubrication pump (electric)	80.9
Paving equipment	72.2
Pipe Jacking System	83.0
Plate compactor	78.2
Roller	75.0
Saw	89.6
Tunnel-boring machine (electric)	82.0
Vacuum Street Sweeper	76.6
Welder	74.0
SOURCE: Federal Highway Administration, <i>Roadway Construction Noise Model</i> , Version 1.1, 2008.	

Table 5 lists the combined construction equipment noise levels by phase. The phased noise level is the combination of all construction equipment for each phase. Detailed equipment lists and calculations are included in **Appendix A**. For example, a total of eight pieces of equipment are included in the combined noise level for the “Pipe Jacking Pipe Installation” phase, and the maximum combined construction noise level would be 84.9 dBA $L_{eq(8-hour)}$ at 50 feet. During construction it is unlikely for eight pieces of equipment to be operating in the same location on the same day and this represents a conservative analysis scenario.

It is anticipated that each phase of construction may have two or three pieces of equipment operating to accomplish the task of the day. Due to the limited size of the construction zone, all construction noise levels are estimated using the distance from the center of the project site. Sensitive receptors were assessed based upon the loudest construction phase that would occur in their vicinity.

TABLE 5: PHASED CONSTRUCTION NOISE LEVELS	
Construction Phase	Combined Noise Level at 50 feet (dBA, L_{eq} (8-hour))
Open Trench Demolition/Site Preparation	78.1
Open Trench Excavation & Shoring	78.0
Open Trench Pipe Installation	77.4
Open Trench Work Site Restoration	79.1
Open Trench Backfill	78.0
Pipe Jacking Demolition/Site Preparation	78.1
Pipe Jacking Excavation & Shoring	78.0
Pipe Jacking Pipe Installation	84.9
Pipe Jacking Work Site Restoration	79.1
Pipe Jacking Backfill	78.0
SOURCE: Federal Highway Administration, <i>Roadway Construction Noise Model</i> , Version 1.1, 2008.	

Open-trench excavation is a construction method typically used to install pipelines and their appurtenances. In general, the process consists of site preparation, excavation and shoring, pipe installation and backfilling, and work site restoration. Construction would typically occur within an approximately 800- to 1,000-foot work area, within traffic lanes. Pipe jacking, which is a form of tunneling, would be used to reduce traffic disruptions at busy intersections and to extend underneath features along the alignment that are not suitable for open-trench construction. Pipe jacking would occur at Porter Ranch Drive, Corbin Avenue, Tampa Avenue, Reseda Boulevard, and under State Route 118 to reduce disruptions to local traffic. The loudest phase of open-trench construction would be the “Work Site Restoration” phase which would generate a noise level of 79.1 dBA, L_{eq} (8-hour) during a typical workday. The loudest phase Pipe jacking would be the “Pipe Installation” phase which would generate a noise level of 84.9 dBA, L_{eq} (8-hour) during a typical workday. **Table 6** presents the estimated maximum construction noise levels at sensitive receptors that would exceed the 80 dBA, L_{eq} (8-hour) threshold. A complete list of analyzed sensitive receptors within 500 feet of the proposed project is included in **Appendix A**. Open-trench construction would not result in an exceedance of the 80 dBA, L_{eq} (8-hour) threshold at sensitive receptors. However, Pipe jacking at Tampa Avenue and Reseda Boulevard would result in noise levels that would exceed the 80 dBA, L_{eq} (8-hour) threshold. Therefore, without mitigation, the proposed project would result in a significant impact related to on-site construction noise.

TABLE 6: CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS

Sensitive Receptor	Distance from Project Site (feet) /a/	Existing Noise Level (dBA, Leq)	Main Construction Type	Combined Construction Noise Level (dBA, Leq (8-hour))	Exceed Threshold? (80 dBA, Leq (8-hour))
Residences between Corbin Ave. and Tampa Ave.	55	70.2	Pipe Jacking	84.1	Yes
Residences between Amigo Ave. and Reseda Blvd.	75	67.5	Pipe Jacking	81.4	Yes
Residences between Reseda Blvd. and Derby Ave.	70	68.1	Pipe Jacking	82.0	Yes
/a/ Measured from the nearest construction work zone. SOURCE: TAHA, 2025.					

Construction activity would also generate noise through off-site truck trips on the local roadway network. During the peak of construction, an average of approximately 10 daily off-site truck trips would be required. Over an eight-hour workday, the maximum hourly haul truck volume would be approximately one truck trip per hour. Trucks would access the project site using Rinaldi Street, which is a busy arterial roadway. A doubling of traffic volume is typically needed to audibly increase noise levels along a roadway segment. Existing AM and PM peak hour traffic volumes are shown in **Table 7**, with approximately 500 to 2,000 trips occurring within those time periods. An additional approximately 10 trucks per day (one truck per hour) would not double the volume on any roadway segment and off-site vehicle activity would not audibly change average daily noise levels. Therefore, the proposed project would result in a less-than-significant impact related to haul truck and delivery truck noise.

TABLE 7: EXISTING TRAFFIC VOLUMES

Roadway Segment	Traffic Volumes		
	AM Peak Hour	PM Peak Hour	Daily
Rinaldi St. at Torino Wy.	479	748	8,372
Rinaldi St. at Corbin Ave.	1,662	2,296	26,606
Rinaldi St. at Wilbur Ave.	1,496	2,320	26,393
Rinaldi St. at Andasol Ave.	2,381	2,385	Not Available
Rinaldi St. at Balboa Blvd.	1,337	2,053	19,752
SOURCE: Los Angeles Department of Transportation, <i>24-Hours Traffic Volume, Rinaldi Street and Torino Way</i> , August 9, 2024; Los Angeles Department of Transportation, <i>24-Hours Traffic Volume, Rinaldi Street at Corbin Avenue</i> , June 12, 2024; Los Angeles Department of Transportation, <i>24-Hours Traffic Volume, Rinaldi Street and Wilbur Avenue</i> , June 25, 2024; Los Angeles Department of Transportation, <i>Manual Traffic Count Summary, Rinaldi Street and Andasol Ave</i> , April 29, 2015; Los Angeles Department of Transportation, <i>24-Hours Traffic Volume, Rinaldi Street at Balboa Boulevard</i> , September 13, 2010.			

Operations

Operational activities would be limited to scheduled maintenance and emergency repair and would not include a significant source of noise. Maintenance activities would be minimal and would be similar to those that occur under existing conditions, including exercising valves and replacing or repairing worn appurtenances to ensure proper performance over the life of the facilities. No additional permanent workers would be required to operate or maintain the project. Operations would not result in an increase in permanent ambient noise levels of 3 dBA CNEL or to within the Normally Unacceptable or Clearly Unacceptable categories or of any 5 dBA CNEL or more, and would not cause noise levels to increase by

5 dBA or more due to mechanical equipment at any other property. Therefore, the proposed project would result in a less-than-significant impact related to operational noise.

Mitigation Measures

N1 Barriers, such as, but not limited to, plywood structures or flexible sound control curtains extending eight feet in height shall be erected around the perimeter of the jacking pits at Tampa Avenue and Reseda Boulevard to block the line-of-sight between receptors and construction equipment. The noise barriers shall enclose perimeters in their entirety, with a gap maintained for access to the site where necessary. Noise barriers shall be capable of reducing construction noise levels by at least 10 dBA. Feasibility includes, but is not limited to, ensuring that the enclosures do not create safety hazards associated with vehicle sight lines or maintaining access to the project site.

Significance After Mitigation

Construction

Mitigation Measure **N1**, noise barriers, when utilized, would reduce noise by 10 dBA for construction activity. As shown in **Table 8**, implementation of Mitigation Measure **N1** would reduce noise levels to less than 80 dBA, L_{eq} (8-hour) at nearby sensitive receptors. Consistent with the LAMC, all feasible measures would be taken to control construction noise. Therefore, the proposed project would result in a less-than-significant impact related to construction noise with mitigation incorporated.

TABLE 8: MITIGATED CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS					
Sensitive Receptor	Distance from Project Site (feet) /a/	Existing Noise Level (dBA, L_{eq})	Mitigation Measure /b/	Mitigated Construction Noise Level (dBA, L_{eq} (8-hour))	Exceed Threshold? (80 dBA, L_{eq} (8-hour))
Residences between Corbin Ave. and Tampa Ave.	55	70.2	N1	74.1	No
Residences between Amigo Ave. and Reseda Blvd.	75	67.5	N1	71.4	No
Residences between Reseda Blvd. and Derby Ave.	70	68.1	N1	72.0	No
/a/ Measured from the nearest construction work zone. /b/ Mitigation Measure N1 Includes a 10 dB reduction for a temporary noise barrier. SOURCE: TAHA, 2025.					

b) Would the proposed project result in generation of excessive ground-borne vibration or ground-borne noise levels? (Less-Than-Significant Impact)

Construction

Construction activity can generate varying degrees of vibration, depending on the procedure and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels.

In most cases, the primary concern regarding construction vibration relates to damage. Activities that can result in damage include excavation near sensitive structures. Typical vibration levels associated with construction equipment are provided in **Table 9**. Residences within the project vicinity are older structures and are therefore subject to the 0.3 inches per second PPV vibration damage threshold. A vibratory roller would generate the highest vibration level of 0.210 inches per second PPV at 25 feet. Construction would occur 50 feet or more from the nearest structures and the 0.3 inches per second vibration damage threshold would not be exceeded. Therefore, the proposed project would result in a less-than-significant impact related to construction vibration damage at nearby structures.

TABLE 9: TYPICAL OUTDOOR CONSTRUCTION EQUIPMENT VIBRATION LEVELS	
Equipment	PPV at 25 Feet (Inches/Second)
Vibratory Roller	0.210
Loaded Truck	0.076
Excavator	0.040
Small Bulldozer	0.003
SOURCE: FTA, <i>Transit Noise and Vibration Impact Assessment</i> , September 2018; New Hampshire Department of Transportation, <i>Ground Vibrations Emanating from Construction Equipment</i> , September 8, 2012.	

Four historic structures have been identified within the project vicinity that would have the potential to be sensitive to construction vibration. These structures are subject to 0.25 inches per second PPV vibration damage threshold for historic buildings. As shown in **Table 10**, the vibration threshold would not be exceeded at any of the historic buildings. Therefore, the proposed project would result in a less-than-significant impact related to construction vibration damage at historic buildings.

TABLE 10: HISTORIC USE VIBRATION ANALYSIS			
Historic Uses/Address	Distance from Construction Activity (feet)	PPV at Historic Use (Inches/Second)	Exceed Vibration 0.25 Inches/Second PPV Damage Threshold?
Residence (17551 Rinaldi St.)	65	0.05	No
Hillcrest Christian Church/Heritage Christian Church (17531 Rinaldi St.)	105	0.02	No
William Shallenberger Residence (11515 Shoshone Ave.)	180	0.01	No
Residence (11525 Shoshone Ave.)	310	0.005	No
SOURCE: TAHA, 2025; City of Los Angeles, HistoricPlacesLA Los Angeles Historic Resource Inventory, available at: https://historicplacesla.lacity.org/ , accessed September 18, 2025.			

Operations

Operations of the proposed project would be similar to the existing facilities and would not include a significant new source of operational vibration. Limited vibrations would be generated by vehicles intermittently visiting the project site. Rubber-tired vehicles, including trucks, rarely generate perceptible vibration.⁵ It is not anticipated that project-related trucks would generate perceptible vibration adjacent to the roadway network. Vibration levels would not exceed the residential 80 VdB or daytime use 83 VdB vibration annoyance thresholds. Therefore, the proposed project would result in a less-than-significant impact related to operational vibration.

⁵FTA, *Transit Noise and Vibration Impact Assessment*, September 2018.

- c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the proposed project expose people residing or working in the project area to excessive noise levels? (No Impact)**

The project site is not located within an airport land use plan, nor is it located within two miles of a private airstrip or public airport. The nearest airport is the Van Nuys Airport located approximately four miles to the south. There is no potential for the proposed project to expose people working or residing in the area to excessive aircraft noise. Therefore, no impact would occur.

References

California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

California Department of Transportation, *Traffic Noise Analysis Protocol*, April 2020.

City of Los Angeles, HistoricPlacesLA Los Angeles Historic Resource Inventory, available at: <https://historicplacesla.lacity.org/>, accessed September 18, 2025.

Federal Highway Administration, *Roadway Construction Noise Model*, Version 1.1, 2008.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

Los Angeles Department of Transportation, *24-Hours Traffic Volume, Rinaldi Street and Torino Way*, August 9, 2024

Los Angeles Department of Transportation, *24-Hours Traffic Volume, Rinaldi Street at Corbin Avenue*, June 12, 2024

Los Angeles Department of Transportation, *24-Hours Traffic Volume, Rinaldi Street and Wilbur Avenue*, June 25, 2024

Los Angeles Department of Transportation, *24-Hours Traffic Volume, Rinaldi Street at Balboa Boulevard*, September 13, 2010.

Los Angeles Department of Transportation, *Manual Traffic Count Summary, Rinaldi Street and Andasol Ave*, April 29, 2015

New Hampshire Department of Transportation, *Ground Vibrations Emanating from Construction Equipment*, September 8, 2012.

APPENDIX A

Noise and Vibration Calculations

Noise Formulas

Noise Distance Attenuation

Hard Site

$$N_i = N_o - 20 \cdot \text{LOG}(D_i/D_o)$$

N_i = attenuated noise level of interest

N_o = reference noise level

D_i = distance to receptor ($D_i > D_o$)

D_o = reference distance

Source: (Bolt, Beranek, and Newman, 1971)

Summation of Noise Levels

$$\text{Equation: } N_s = 10 \times \text{LOG}10((10^{(N_1/10)}) + (10^{(N_2/10)}) + (10^{(N_3/10)}) + (10^{(N_4/10)}))$$

N_s = Noise Level Sum

N_1 = Noise Level 1

N_2 = Noise Level 2

N_3 = Noise Level 3

N_4 = Noise Level 4

$$= 10 \cdot \text{LOG}(\text{SUM}(10^{(\text{UserRange}/10)}))$$

Source: California Department of Transportation, Technical Noise Supplement, 2013

Construction Equipment Noise Levels			
Construction Equipment	Noise Level at 50 feet (dBA, Lmax)	Usage	8-hour Leq
Air compressor	77.7	0.2	70.7
Backhoe	72.6	0.3	67.4
Blower	77.7	0.25	71.7
Crane	75.6	0.16	67.6
Excavator	75.7	0.3	70.5
Forklift	78.4	0.2	71.4
Front-end loader	74.1	0.4	70.1
Generator	80.6	0.2	73.6
High-pressure water pump	80.9	0.5	77.9
Lubrication pump (electric)	80.9	0.5	77.9
Paving equipment	72.2	0.5	69.2
Pipe Jacking System	83.0	0.5	80.0
Plate compactor	78.2	0.2	71.2
Roller	75.0	0.2	68.0
Saw	89.6	0.2	82.6
Tunnel-boring machine (electric)	82.0	0.25	76.0
Vacuum Street Sweeper	76.6	0.1	66.6
Welder	74.0	0.3	68.8

SOURCE: Federal Highway Administration, *Roadway Construction Noise Model*, Version 1.1, 2008.

Construction Noise Levels Open Trench	
Construction Equipment	Noise Level at 50 feet (dBA, Leq[8-hour])
Open Trench Demolition/Site Preparation	
Excavator	70.5
Backhoe	67.4
Forklift	71.4
Air compressor	70.7
Generator	73.6
Combined Equipment Noise	78.1
Open Trench Excavation & Shoring	
Excavator	70.5
Backhoe	67.4
Front-end loader	70.1
Forklift	71.4
Generator	73.6
Combined Equipment Noise	78.0
Open Trench Pipe Installation	
Generator	73.6
Backhoe	67.4
Welder	68.8
Forklift	71.4
Crane	67.6
Combined Equipment Noise	77.4
Open Trench Work Site Restoration	
Paving Equipment	69.2
Plate compactor	71.2
Vacuum Street Sweeper	66.6
Roller	68.0
Forklift	71.4
Generator	73.6
Air compressor	70.7
Combined Equipment Noise	79.1
Open Trench Backfill	
Excavator	70.5
Backhoe	67.4
Front-end loader	70.1
Forklift	71.4
Generator	73.6
Combined Equipment Noise	78.0

Construction Noise Levels Pipe Jacking	
Pipe Jacking Demolition/Site Preparation	
Excavator	70.5
Backhoe	67.4
Forklift	71.4
Air compressor	70.7
Generator	73.6
Combined Equipment Noise	78.1
Pipe Jacking Excavation & Shoring	
Excavator	70.5
Backhoe	67.4
Front-end loader	70.1
Forklift	71.4
Generator	73.6
Combined Equipment Noise	78.0
Pipe Jacking Pipe Installation	
Tunnel-boring machine (electric)	76.0
Excavator	70.5
Pipe Jacking System	80.0
Generator	73.6
Lubrication pump (electric)	77.9
High-pressure water pump	77.9
Crane	67.6
Welder	68.8
Combined Equipment Noise	84.9
Pipe Jacking Work Site Restoration	
Paving Equipment	69.2
Plate Compactor	71.2
Vacuum Street Sweeper	66.6
Roller	68.0
Forklift	71.4
Generator	73.6
Air compressor	70.7
Combined Equipment Noise	79.1
Pipe Jacking Backfill	
Excavator	70.5
Backhoe	67.4
Front-end loader	70.1
Forklift	71.4
Generator	73.6
Combined Equipment Noise	78.0
Source: Federal Highway Administration, Roadway Construction Noise Model, 2008.	

CONSTRUCTION NOISE LEVELS	
Construction Phase	Combined Noise Level at 50 feet (dBA, Leq)
Open Trench Demolition/Site Preparation	78.1
Open Trench Excavation & Shoring	78.0
Open Trench Pipe Installation	77.4
Open Trench Work Site Restoration	79.1
Open Trench Backfill	78.0
Pipe Jacking Demolition/Site Preparation	78.1
Pipe Jacking Excavation & Shoring	78.0
Pipe Jacking Pipe Installation	84.9
Pipe Jacking Work Site Restoration	79.1
Pipe Jacking Backfill	78.0
Source: Federal Highway Administration, Roadway Construction Noise Model, 2008.	

EXISTING AMBIENT NOISE LEVELS AT MONITORING LOCATIONS		
Noise Monitoring Site	Noise Monitoring Location	Noise Level (dB A, Leq)
1	Residence (11015 Larline Ave.)	50.4
2	Rinaldi St. and Porter Ranch Dr.	69.3
3	Residence (11257 Key W. Ave.)	71.8
4	Residence (11331 Pala Mesa Dr.)	56.5
5	Rinaldi St. and Reseda Blvd.	69.4
6	Residence (18218 Bathurst St.)	53.1
7	Rinaldi Adult Center	69.6
8	Residence (17185 Flanders St.)	53.5

SOURCE: TAJHA, 2025.

CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS							
Sensitive Receptors	Distance (feet) from Center of Site	Intervening Building /a/	Main Construction Type	Reference Noise Level (dBA)	Construction Noise at Receptor from Center of Site (dBA, Leq (8-hour))	Existing Ambient (dBA, Leq)	Exceed 80 dBA, Leq (8-hour) Threshold?
First Row Receptors							
Sierra Canyon School	50	0	Open Trench	79.1	79.1	50.4	No
Residences north of Rinaldi St. between De Soto Ave. and Gazette Ave.	390	0	Open Trench	79.1	61.2	50.4	No
Residences south of Rinaldi St. between Gazette Ave. and Oklahoma Ave	405	0	Open Trench	79.1	60.9	50.4	No
Residences along Celtic St.	215	0	Open Trench	79.1	66.4	50.4	No
Residences along Edgewood Ct.	110	0	Pipe Jacking	84.9	78.1	50.4	No
Residences north of Rinaldi Street between 118 Fwy and Torino Wy.	140	0	Pipe Jacking	84.9	76.0	50.4	No
Residences north of Rinaldi Street between Torino Wy. and Mason Ave.	120	0	Open Trench	79.1	71.5	50.4	No
Residences north of Rinaldi St. between Mason Ave. and Avenida Alegre	100	0	Open Trench	79.1	73.1	50.4	No
Shepard Church	150	0	Pipe Jacking	84.9	75.4	69.3	No
In Christ Community	175	0	Pipe Jacking	84.9	74.0	69.3	No
Residences between Corbin Ave. and Tampa Ave.	55	0	Pipe Jacking	84.9	84.1	71.8	Yes
Residences between Tampa Ave. and Quail Creek Rd.	395	0	Pipe Jacking	84.9	67.0	56.5	No
Residences south of Rinaldi St. between Tampa Ave. and Wilbur Ave.	50	0	Open Trench	79.1	79.1	71.8	No
Residences north of Rinaldi St. between Porter Valley Dr. and Wilbur Ave.	390	0	Open Trench	79.1	61.2	56.5	No
Residences between Wilbur Ave. and Amigo Ave.	75	0	Open Trench	79.1	75.6	69.4	No
Residences between Amigo Ave. and Reseda Blvd.	75	0	Pipe Jacking	84.9	81.4	69.4	Yes
Residences between Reseda Blvd. and Derby Ave.	70	0	Pipe Jacking	84.9	82.0	69.4	Yes
Residences between Derby Ave. and Etiwanda Ave.	70	0	Open Trench	79.1	76.2	69.4	No
Residences between Etiwanda Ave. and Chinnineas Ave.	175	0	Open Trench	79.1	68.2	53.1	No
Residences between Chinnineas Ave. and Hesperia Ave.	270	0	Open Trench	79.1	64.4	53.1	No
Temple Ahavat Shalom	480	0	Open Trench	79.1	59.4	53.1	No
Residences south of Rinaldi St. along Chinnineas Ave.	355	0	Open Trench	79.1	62.1	53.1	No
Residences north of Rinaldi St. between Hesperia Ave. and Zelzah Ave.	110	0	Open Trench	79.1	72.2	69.6	No
Residences south of Rinaldi St. between Hesperia Ave. and Zelzah Ave.	50	0	Open Trench	79.1	79.1	69.6	No
Residences north of Rinaldi St. between Zelzah Ave. and Shoshone Ave.	100	0	Open Trench	79.1	73.1	69.6	No
Residences south of Rinaldi St. between Zelzah Ave. and Encino Ave.	50	0	Open Trench	79.1	79.1	69.6	No
Granada Hills KinderCare	50	0	Open Trench	79.1	79.1	69.6	No
Heritage Christian School - Elementary (North)	105	0	Open Trench	79.1	72.6	69.6	No
Rinaldi Adult Center	50	0	Open Trench	79.1	79.1	69.6	No
Residences north of Rinaldi St. between Shoshone Ave. and Louise Ave.	115	0	Open Trench	79.1	71.8	69.6	No
Residences south of Rinaldi St. between Andasol Ave. and Louise Ave.	50	0	Open Trench	79.1	79.1	69.6	No
Residences north of Rinaldi St. between Louise Ave. and McLennan Ave.	50	0	Open Trench	79.1	79.1	69.6	No
Residences south of Rinaldi St. between Louise Ave. and McLennan Ave.	95	0	Open Trench	79.1	73.5	69.6	No
Second Row Receptors							
Residences south of Rinaldi St. between De Soto Ave. and Larline Ave.	465	4.5	Open Trench	79.1	55.2	50.4	No
Residences along Celtic St.	455	4.5	Open Trench	79.1	55.4	50.4	No
Residences along Edgewood Ct.	350	4.5	Pipe Jacking	84.9	63.5	50.4	No
Residences north of Rinaldi Street between 118 Fwy and Torino Wy.	295	4.5	Pipe Jacking	84.9	59.0	50.4	No
Residences north of Rinaldi Street between Torino Wy. and Mason Ave.	295	4.5	Open Trench	79.1	65.2	50.4	No
Residences between Mason Ave. and Avenida Alegre	330	4.5	Open Trench	79.1	58.2	50.4	No
Residences between Corbin Ave. and Tampa Ave.	205	4.5	Pipe Jacking	84.9	68.2	56.5	No
Residences south of Rinaldi St. between Tampa Ave. and Wilbur Ave.	315	4.5	Open Trench	79.1	58.6	56.5	No
Residences between Wilbur Ave. and Amigo Ave.	293	4.5	Open Trench	79.1	59.2	69.4	No
Residences between Amigo Ave. and Reseda Blvd.	270	4.5	Pipe Jacking	84.9	65.8	69.4	No
Residences between Reseda Blvd. and Derby Ave.	185	4.5	Pipe Jacking	84.9	69.1	69.4	No
Residences between Derby Ave. and Etiwanda Ave.	185	4.5	Open Trench	79.1	63.2	69.4	No
Residences between Etiwanda Ave. and Chinnineas Ave.	330	4.5	Open Trench	79.1	58.2	53.1	No
Residences between Chinnineas Ave. and Hesperia Ave.	465	4.5	Open Trench	79.1	55.2	53.1	No
Residences north of Rinaldi St. between Hesperia Ave. and Zelzah Ave.	275	4.5	Open Trench	79.1	59.8	53.1	No
Residences north of Rinaldi St. between Zelzah Ave. and Shoshone Ave.	225	4.5	Open Trench	79.1	61.5	69.6	No
Serenity Kids Academy	205	4.5	Open Trench	79.1	62.3	69.6	No
Masjid Granada Hills	205	4.5	Open Trench	79.1	62.3	69.6	No
Residences north of Rinaldi St. between Shoshone Ave. and Andasol Ave.	265	4.5	Open Trench	79.1	60.1	53.5	No
Residences south of Rinaldi St. between Andasol Ave. and Louise Ave.	200	4.5	Open Trench	79.1	62.5	53.5	No
Residences north of Rinaldi St. between Louise Ave. and McLennan Ave.	345	4.5	Open Trench	79.1	57.8	53.5	No
Residences south of Rinaldi St. between Louise Ave. and McLennan Ave.	220	4.5	Open Trench	79.1	61.7	53.5	No
/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row.							
SOURCE: TAHA, 2025.							

MITIGATED CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS								
Sensitive Receptors	Distance (feet) from Center of Site	Intervening Building /a/	Main Construction Type	Reference Noise Level (dBA)	Mitigation Measure Noise Barrier	Construction Noise at Receptor from Center of Site (dBA, Leq (8-hour))	Existing Ambient (dBA, Leq)	Exceed 80 dBA Leq (8-hour) Threshold?
First Row Receptors								
Residences between Corbin Ave. and Tampa Ave.	55	0	Pipe Jacking	84.9	10	74.1	71.8	No
Residences between Armiga Ave. and Reseda Blvd.	75	0	Pipe Jacking	84.9	10	71.4	69.4	No
Residences between Reseda Blvd. and Derby Ave.	70	0	Pipe Jacking	84.9	10	72.0	69.4	No

SOURCE: TAHA 2025.

Vibration Damage and Annoyance Analysis

Vibration PPV Attenuation

Equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

PPV (equip) is the peak particle velocity in in/sec of the equipment adjusted for distance

PPV (ref) is the reference vibration level in in/sec at 25 feet from Table 12-2

D is the distance from the equipment to the receiver.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

Construction Vibration Damage Criteria	
Building/Structural Category	PPV, in/sec
Fragile Buildings	0.1
Historic Buildings	0.25
Residences 50 years old or more	0.3
Residences and modern industrial/commercial buildings less than 50 years old	0.5

Vibration Velocities for Construction Equipment		
Equipment	PPV at 25 Feet (Inches/Second)	Safe Distance to Not Exceed Vibration Damage Threshold (feet)
Vibratory Roller	0.210	20
Loaded Truck	0.076	10
Excavator	0.040	6
Small Bulldozer	0.003	3

Source: FTA, Transit Noise and Vibration Impact Assessment, September 2018.

HISTORIC USE VIBRATION ANALYSIS				
Historic Uses/Address	Distance from Construction Activity (feet)	Reference Vibration Level (Inches/Second)	PPV at Historic Use (Inches/Second)	Exceed 0.25 Inches/Second Threshold
Residence (17551 Rinaldi St.)	65	0.21	0.05	No
Hillcrest Christian Church/Heritage Christian Church (17531 Rinaldi St.)	105	0.21	0.02	No
William Shallenberger Residence (11515 Shoshone Ave.)	180	0.21	0.01	No
Residence (11525 Shoshone Ave.)	310	0.21	0.005	No

SOURCE: TAHA, 2025.

APPENDIX B

Noise Monitoring Data

Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 1

Start Time 9/22/2025 2:08:36 PM

Stop Time 9/22/2025 2:23:36 PM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

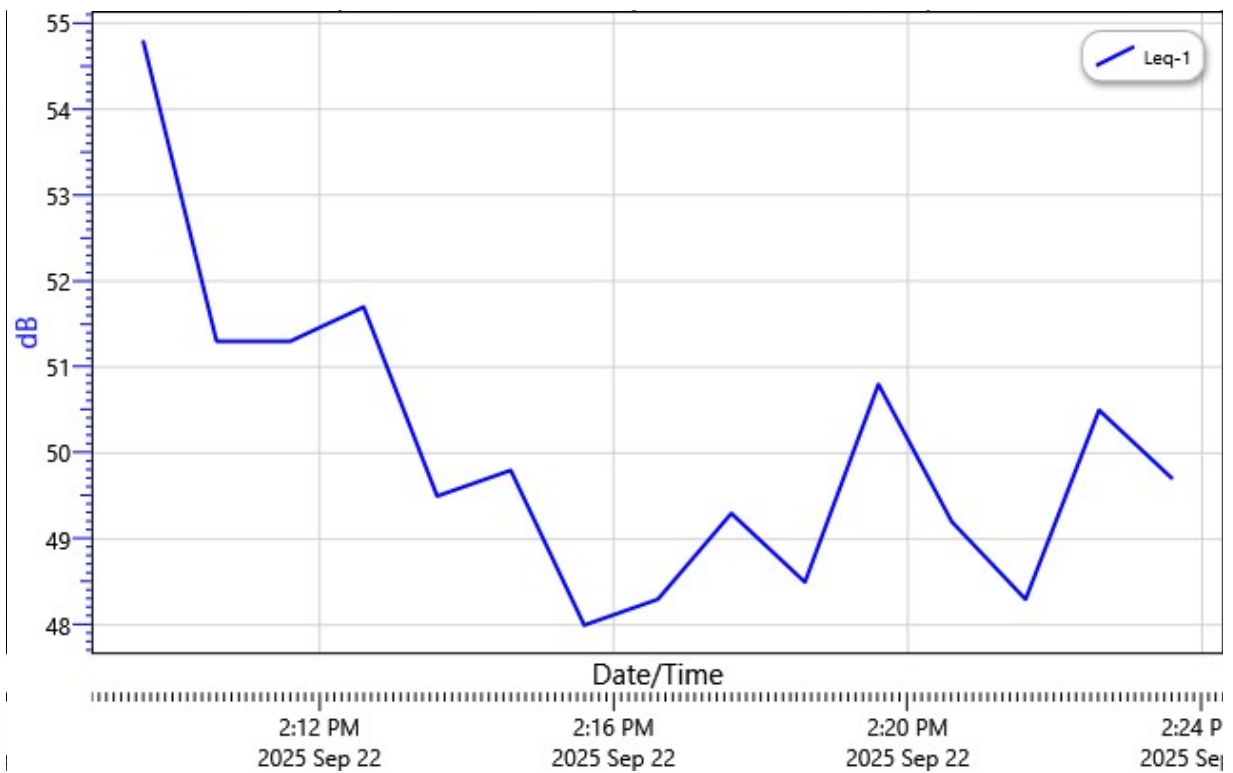
Description	Meter	Value	Description	Meter	Value
Leq	1	50.4 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 2:09:36 PM	54.8
2:10:36 PM	51.3
2:11:36 PM	51.3
2:12:36 PM	51.7
2:13:36 PM	49.5
2:14:36 PM	49.8
2:15:36 PM	48
2:16:36 PM	48.3
2:17:36 PM	49.3
2:18:36 PM	48.5
2:19:36 PM	50.8
2:20:36 PM	49.2
2:21:36 PM	48.3
2:22:36 PM	50.5
2:23:36 PM	49.7

Logged Data Chart

Granada Trunk Line_Site 1: Logged Data Chart



Site 2: Porter Ranch Dr. and Rinaldi St.



Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 2

Start Time 9/22/2025 1:39:15 PM

Stop Time 9/22/2025 1:54:15 PM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

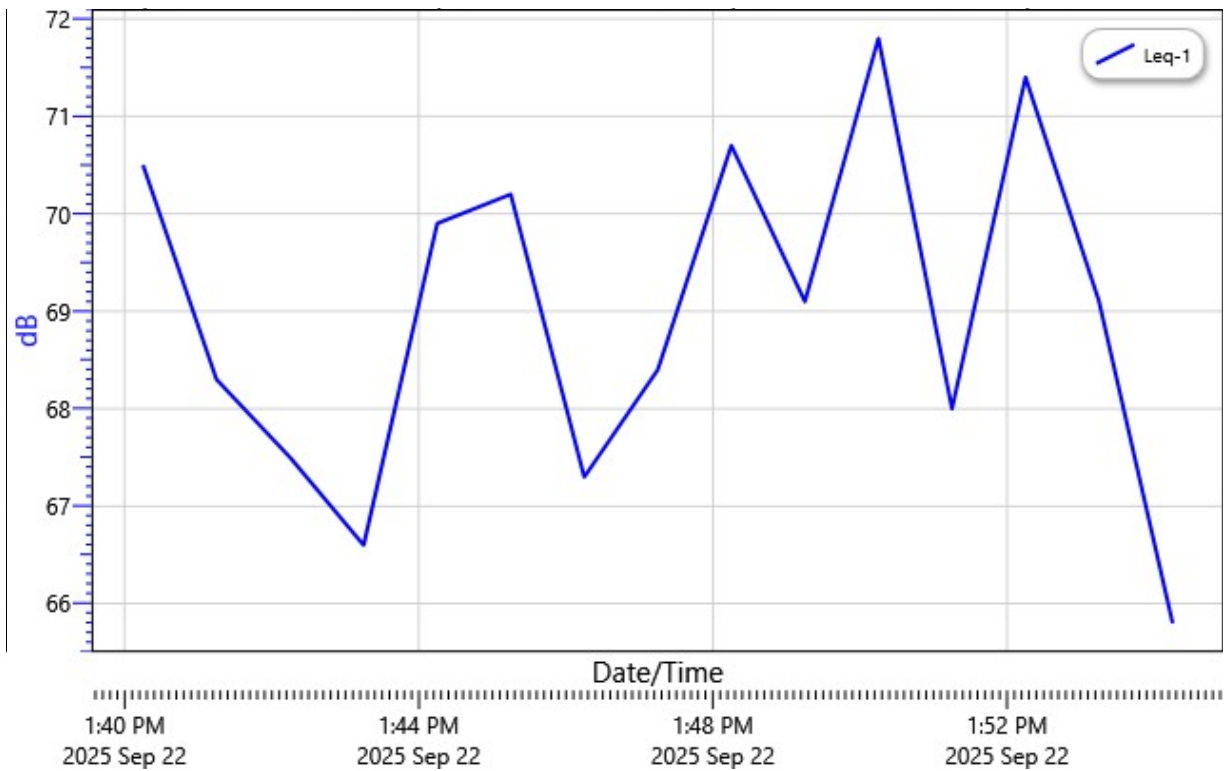
Description	Meter	Value	Description	Meter	Value
Leq	1	69.3 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 1:40:15 PM	70.5
1:41:15 PM	68.3
1:42:15 PM	67.5
1:43:15 PM	66.6
1:44:15 PM	69.9
1:45:15 PM	70.2
1:46:15 PM	67.3
1:47:15 PM	68.4
1:48:15 PM	70.7
1:49:15 PM	69.1
1:50:15 PM	71.8
1:51:15 PM	68
1:52:15 PM	71.4
1:53:15 PM	69.1
1:54:15 PM	65.8

Logged Data Chart

Granada Trunk Line_Site 2: Logged Data Chart



Site 3: Residence (11257 Key W. Ave.)



Session Report

9/22/2025

Information Panel

Name S553Granada Trunk Line_Site 3
Start Time 9/22/2025 1:00:33 PM
Stop Time 9/22/2025 1:15:33 PM
Device Name BGS100001
Model Type SoundPro DL
Device Firmware Rev R.13J
Comments

Summary Data Panel

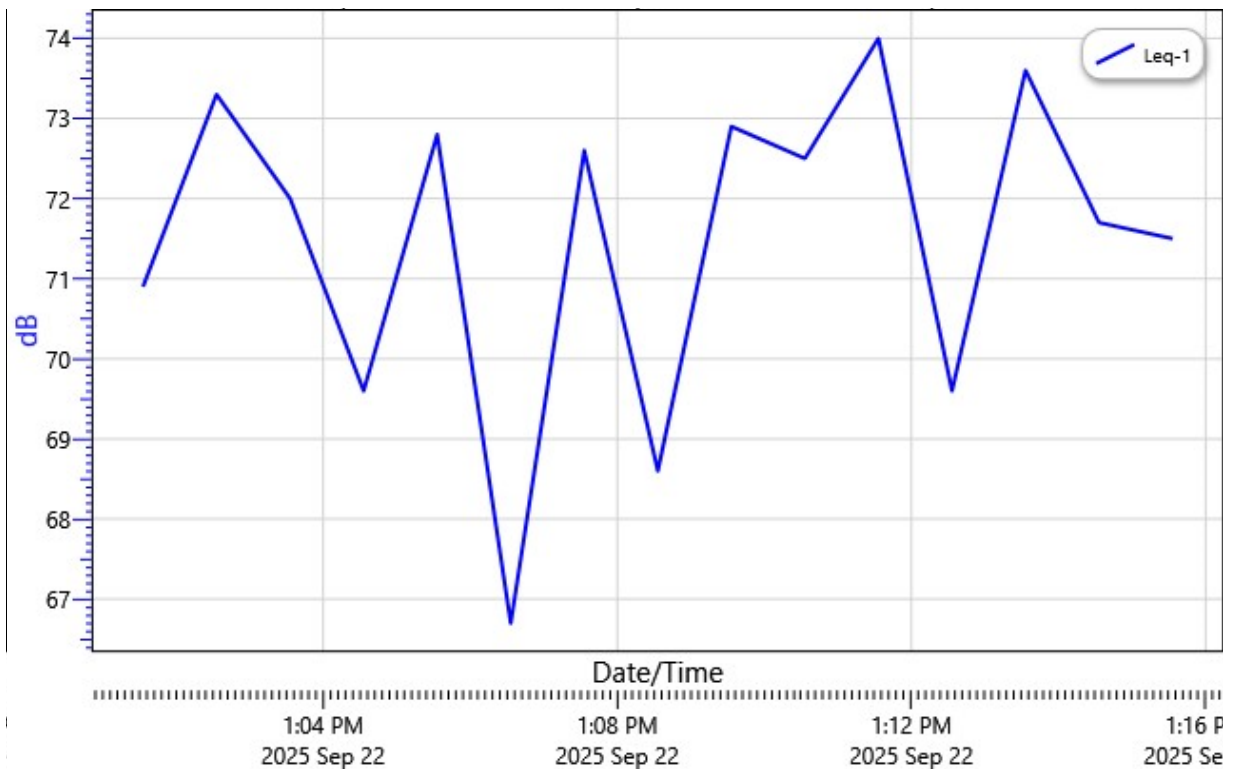
Description	Meter	Value	Description	Meter	Value
Leq	1	71.8 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 1:01:33 PM	70.9
1:02:33 PM	73.3
1:03:33 PM	72
1:04:33 PM	69.6
1:05:33 PM	72.8
1:06:33 PM	66.7
1:07:33 PM	72.6
1:08:33 PM	68.6
1:09:33 PM	72.9
1:10:33 PM	72.5
1:11:33 PM	74
1:12:33 PM	69.6
1:13:33 PM	73.6
1:14:33 PM	71.7
1:15:33 PM	71.5

Logged Data Chart

S553Granada Trunk Line_Site 3: Logged Data Chart



Site 4: Residence (11331 Pala Mesa Dr.)



Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 4

Start Time 9/22/2025 12:35:49 PM

Stop Time 9/22/2025 12:50:49 PM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

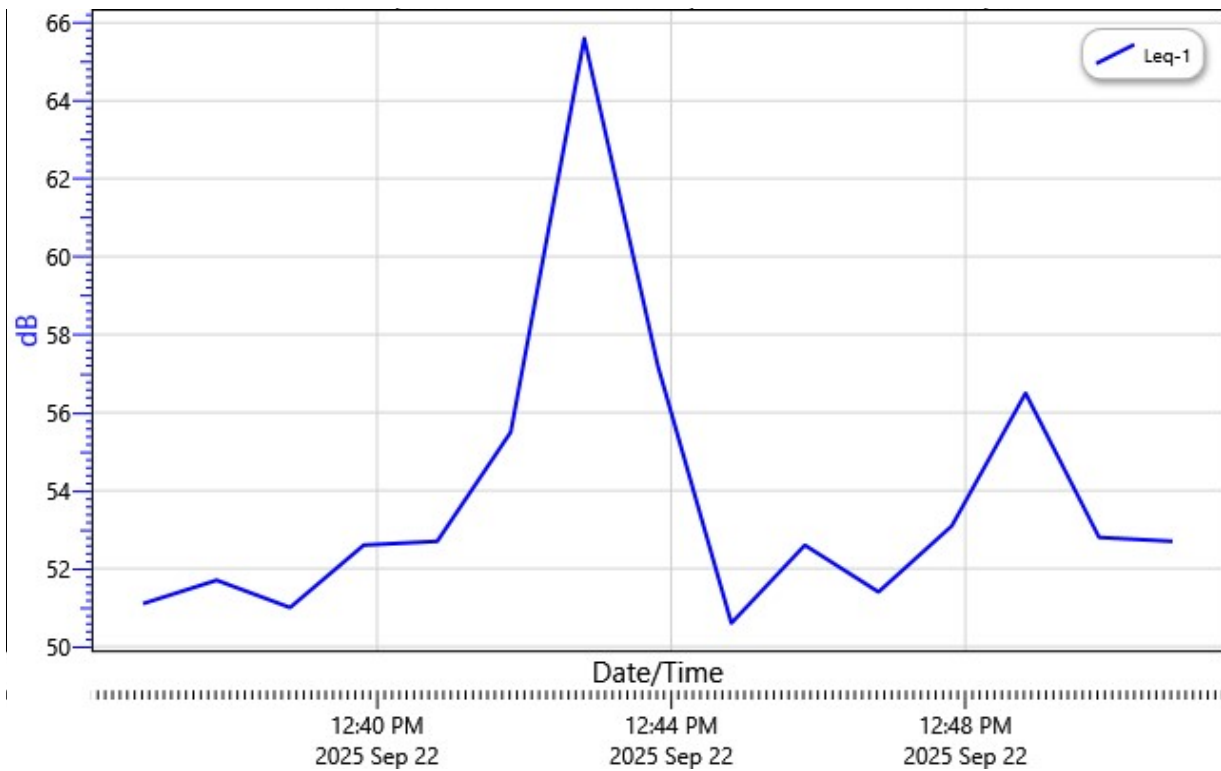
Description	Meter	Value	Description	Meter	Value
Leq	1	56.5 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 12:36:49 PM	51.1
12:37:49 PM	51.7
12:38:49 PM	51
12:39:49 PM	52.6
12:40:49 PM	52.7
12:41:49 PM	55.5
12:42:49 PM	65.6
12:43:49 PM	57.2
12:44:49 PM	50.6
12:45:49 PM	52.6
12:46:49 PM	51.4
12:47:49 PM	53.1
12:48:49 PM	56.5
12:49:49 PM	52.8
12:50:49 PM	52.7

Logged Data Chart

Granada Trunk Line_Site 4: Logged Data Chart



Site 5: Rinaldi St. and Reseda Blvd.



Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 5

Start Time 9/22/2025 12:12:02 PM

Stop Time 9/22/2025 12:27:02 PM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

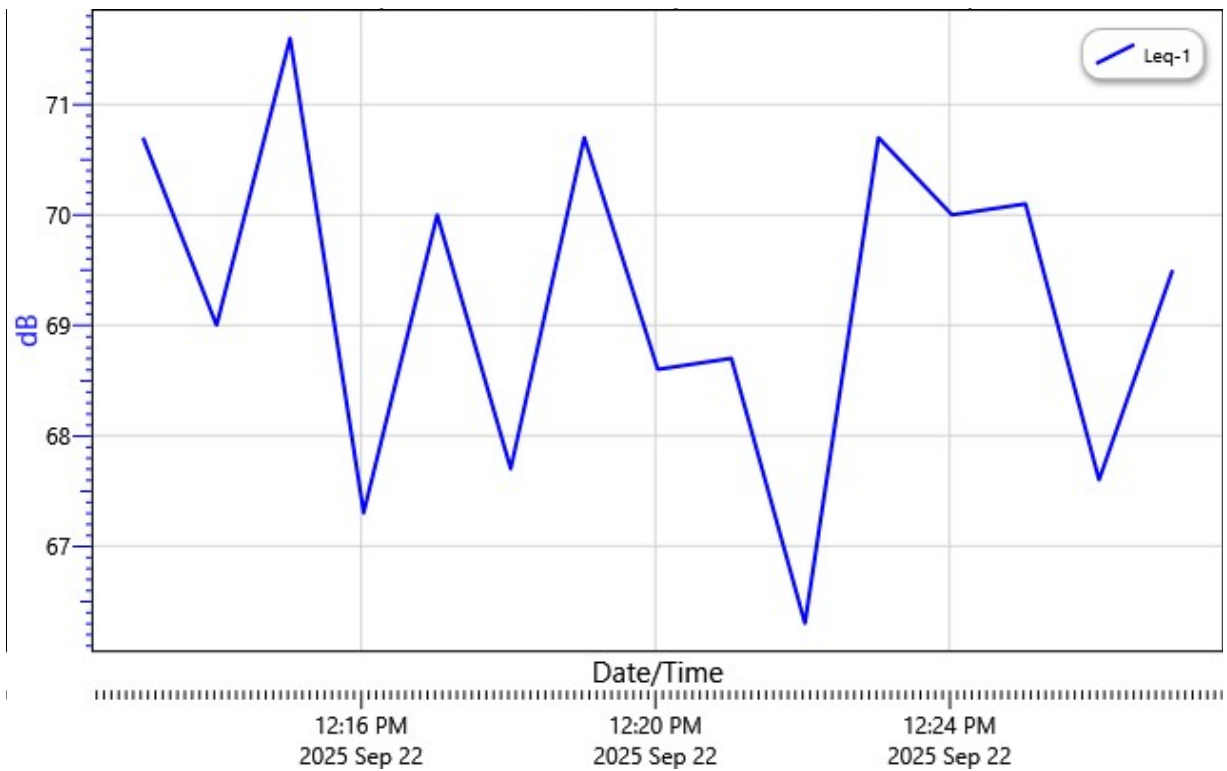
Description	Meter	Value	Description	Meter	Value
Leq	1	69.4 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 12:13:02 PM	70.7
12:14:02 PM	69
12:15:02 PM	71.6
12:16:02 PM	67.3
12:17:02 PM	70
12:18:02 PM	67.7
12:19:02 PM	70.7
12:20:02 PM	68.6
12:21:02 PM	68.7
12:22:02 PM	66.3
12:23:02 PM	70.7
12:24:02 PM	70
12:25:02 PM	70.1
12:26:02 PM	67.6
12:27:02 PM	69.5

Logged Data Chart

Granada Trunk Line_Site 5: Logged Data Chart



Site 6: Residence (18218 Bathurst St.)



Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 6

Start Time 9/22/2025 11:47:27 AM

Stop Time 9/22/2025 12:02:27 PM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

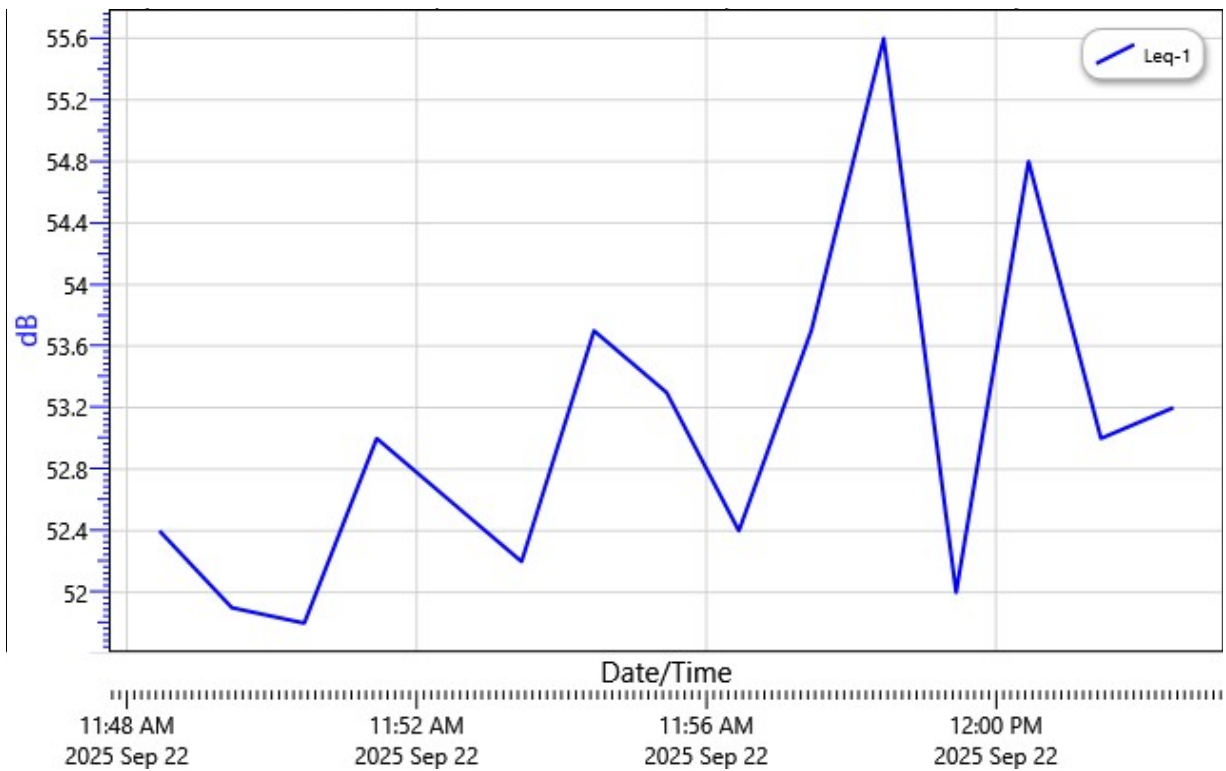
Description	Meter	Value	Description	Meter	Value
Leq	1	53.1 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 11:48:27 AM	52.4
11:49:27 AM	51.9
11:50:27 AM	51.8
11:51:27 AM	53
11:52:27 AM	52.6
11:53:27 AM	52.2
11:54:27 AM	53.7
11:55:27 AM	53.3
11:56:27 AM	52.4
11:57:27 AM	53.7
11:58:27 AM	55.6
11:59:27 AM	52
12:00:27 PM	54.8
12:01:27 PM	53
12:02:27 PM	53.2

Logged Data Chart

Granada Trunk Line_Site 6: Logged Data Chart



Site 7: Rinaldi Adult Center



Session Report

9/22/2025

Information Panel

Name Granada Trunk Line_Site 7

Start Time 9/22/2025 11:24:42 AM

Stop Time 9/22/2025 11:39:42 AM

Device Name BGS100001

Model Type SoundPro DL

Device Firmware Rev R.13J

Comments

Summary Data Panel

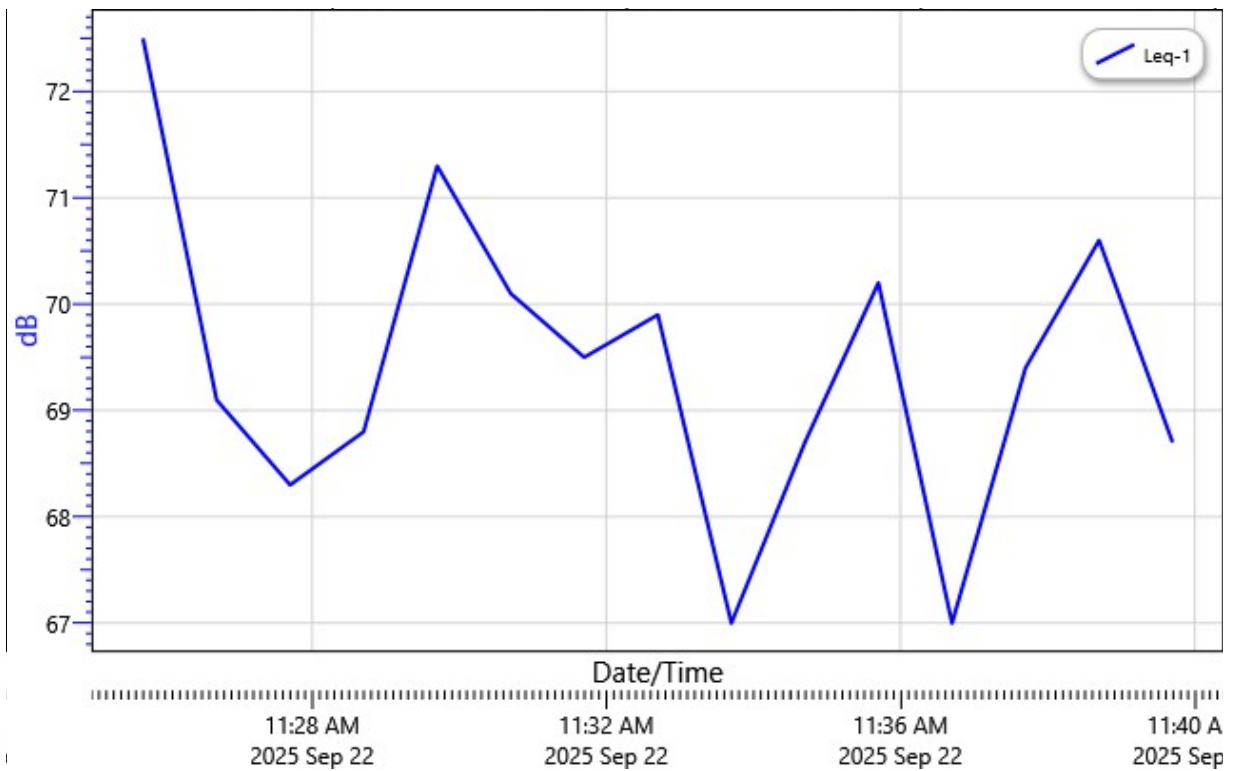
Description	Meter	Value	Description	Meter	Value
Leq	1	69.6 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 11:25:42 AM	72.5
11:26:42 AM	69.1
11:27:42 AM	68.3
11:28:42 AM	68.8
11:29:42 AM	71.3
11:30:42 AM	70.1
11:31:42 AM	69.5
11:32:42 AM	69.9
11:33:42 AM	67
11:34:42 AM	68.7
11:35:42 AM	70.2
11:36:42 AM	67
11:37:42 AM	69.4
11:38:42 AM	70.6
11:39:42 AM	68.7

Logged Data Chart

Granada Trunk Line_Site 7: Logged Data Chart



Site 8: Residence (17185 Flanders St.)



Session Report

9/22/2025

Information Panel

Name	Granada Trunk Line_Site 8
Start Time	9/22/2025 10:58:16 AM
Stop Time	9/22/2025 11:17:34 AM
Device Name	BGS100001
Model Type	SoundPro DL
Device Firmware Rev	R.13J
Comments	Paused at 11:07 am and 11:09 am due to garbage collection truck

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	53.5 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Table

Date/Time	Leq-1
9/22/2025 10:59:16 AM	52.3
11:00:16 AM	50.3
11:01:16 AM	54.4
11:02:16 AM	50.9
11:03:16 AM	57.7
11:04:16 AM	51.6
11:05:16 AM	50.9
11:06:16 AM	56.6
11:07:16 AM	53.2
11:08:16 AM	53.6
11:10:49 AM	54.1
11:14:33 AM	52.7
11:15:33 AM	51.8
11:16:33 AM	50.8
11:17:33 AM	54

Logged Data Chart

Granada Trunk Line_Site 8: Logged Data Chart

