Appendix G

Iron Lofts Multifamily Residential Noise Impact Analysis

Ganddini

April 25, 2025

IRON LOFTS MULTIFAMILY RESIDENTIAL NOISE IMPACT ANALYSIS

April 25, 2025

City of Riverside

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Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

IRON LOFTS MULTIFAMILY RESIDENTIAL NOISE IMPACT ANALYSIS

April 25, 2025

City of Riverside

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Project No. 19630

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EXECUTIVE SUMMARY

The 6.94-acre project site is located east of Commerce Street between 5th Street and Mission Inn Avenue in the City of Riverside, California. The project site is currently partially developed with commercial/industrial buildings and zoned as Business & Manufacturing Park Zone (BMP).

The proposed project (TTM 38624) involves removal of the existing buildings and construction of 295 mid-rise multifamily dwelling units and 5 low-rise multifamily dwelling units within a residential complex. Vehicular access for the project site is proposed via two driveways with one on 5th Street and one on Mission Inn Avenue.

The project site requires a General Plan Amendment and Zoning Amendment to rezone the site from Business & Manufacturing Park Zone (BMP) to Mixed-use Urban (MU-U) to accommodate the residential development and a Specific Plan Amendment to amend the Riverside Marketplace Specific Plan to expand the mixed-used Marketplace Sub-area. The proposed plan also includes a street vacation of 6th Street from Commerce Street to the east side of the project.

Existing Noise Environment

Sensitive receptors that may be affected by project generated noise include the existing single-family residential uses located adjacent to the east, approximately 100 feet southeast (across Mission Inn Avenue), and approximately 65 feet northeast (across 5th Street) and the multi-family residential uses located approximately 100 feet south (across Mission Inn Avenue) of the project site. In addition, North Park is located approximately 361 feet southwest of the project site.

Measured short-term ambient noise levels in the project vicinity ranged between 56.7 and 71.7 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 53.5 to 75.6 dBA L_{eq}. The dominant noise source in the project vicinity was vehicle traffic associated with Mission Inn Avenue, 91 Freeway, Commerce Street, and other surrounding roadways as well as train activity (i.e., moving trains, horns, and crossing bells).

Project Construction Impacts – Onsite Equipment

The City of Riverside's General Plan and Municipal Code do not establish numeric maximum acceptable construction source noise levels for potentially affected receivers. Per the Federal Transit Administration (FTA), daytime construction noise levels should not exceed 80 dBA L_{eq} for an 8-hour period at residential uses and 85 dBA L_{eq} for an 8-hour period at commercial uses. Based on the modeled construction noise levels, construction noise levels are estimated to reach up to 75.29 dBA L_{eq} at the nearest residential property line anx 72.3 dBA L_{eq} at the nearest commercial property line. Furthermore, project construction will not occur outside of the hours outlined in City of Riverside Municipal Code Section 7.35.020(G). Therefore, the project would not exceed established standards relating to construction noise. Project construction would not be anticipated to exceed the FTA thresholds for either residential or commercial uses. The project impact is less than significant; no mitigation is required.

Notwithstanding the above, recommended best management practices (BMPs) are provided in the Project Description which can be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Project Construction Impacts – Offsite Vehicle Trips

Project vehicle traffic generated during project construction would be anticipated to be nominal relative to existing roadway volumes and would not result in the doubling of traffic volume necessary to increase noise levels by 3 dBA. The project impact is less than significant; no mitigation is required.

Operational Noise Impacts – Offsite Vehicle Trips

The addition of project trips is not expected to change noise levels more than the applicable threshold at any of the study roadway segments. The project impact is less than significant; no mitigation is required.

Operational Noise Impacts –Traffic to Project

Transportation related noise is expected to range between 61 and 72 dBA CNEL. Development of infill residential land uses are considered to be "normally acceptable" in areas where noise levels reach up to 65 dBA CNEL. With implementation of the following mitigation measures.

> **Mitigation Measure 1**
> Windows and glass doors shall have STC ratings as presented in Table 13. Where no STC is listed, standard windows that meet California Building Code requirements will suffice.

Groundborne Vibration Impacts

Potential for Damage

Groundborne vibration generated by project construction would exceed the levels necessary to cause architectural damage at the residential structures to the east (along 5th Street and 6th Street) of the project site. The following measure is recommended to ensure groundborne vibration generated by project construction does not cause architectural damage to nearby buildings:

> **Mitigation Measure 2**
> Use of vibratory rollers, or other similar vibratory equipment, within 26 feet of structures surrounding the project site shall be prohibited.

With implementation of Mitigation Measure 1, groundborne vibration generated by project construction would not exceed the levels necessary to cause architectural damage; therefore, the project impact would be less than significant.

Potential for Annoyance

Furthermore, the threshold for annoyance due to vibration (80 VdB at offsite sensitive uses) could be exceeded at the existing residential land uses surrounding the project site and residents may be temporarily annoyed. However, the impact would only occur when construction equipment is operating within 74 feet of the residential structures and only during daytime hours and will be temporary.

Operational Groundborne Vibration

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction. This impact would not be significant. No mitigation is required.

Rail Groundborne Vibration

The proposed project site is located approximately 170 feet southeast of the BNSF rail line. The closest proposed building is approximately 12 feet from the property line. Groundborne vibration generated by project construction would reach up to 53 VdB at the nearest proposed structure and would not exceed any

of the thresholds for potential damage or annoyance. Impacts would be less than significant; no mitigation is required.

Air Traffic Impacts

The project site is located well outside the 55 dBA CNEL noise contours of the Flabob and Riverside Municipal Airports. Therefore, the project would not expose people residing or working in the project area to excessive noise levels associated with airports. The impact would be less than significant; no mitigation is required.

1. INTRODUCTION

This section describes the purpose of this study and the proposed project.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development and operation of the proposed project and to identify mitigation measures that may be necessary to reduce potentially significant impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the City of Riverside, in the context of the California Environmental Quality Act (CEQA).

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms related to noise and vibration analysis.

PROJECT LOCATION

The 6.94-acre project site is located east of Commerce Street between 5th Street and Mission Inn Avenue in the City of Riverside, California. The project site is currently partially developed with commercial/industrial buildings and zoned as Business & Manufacturing Park Zone (BMP). A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

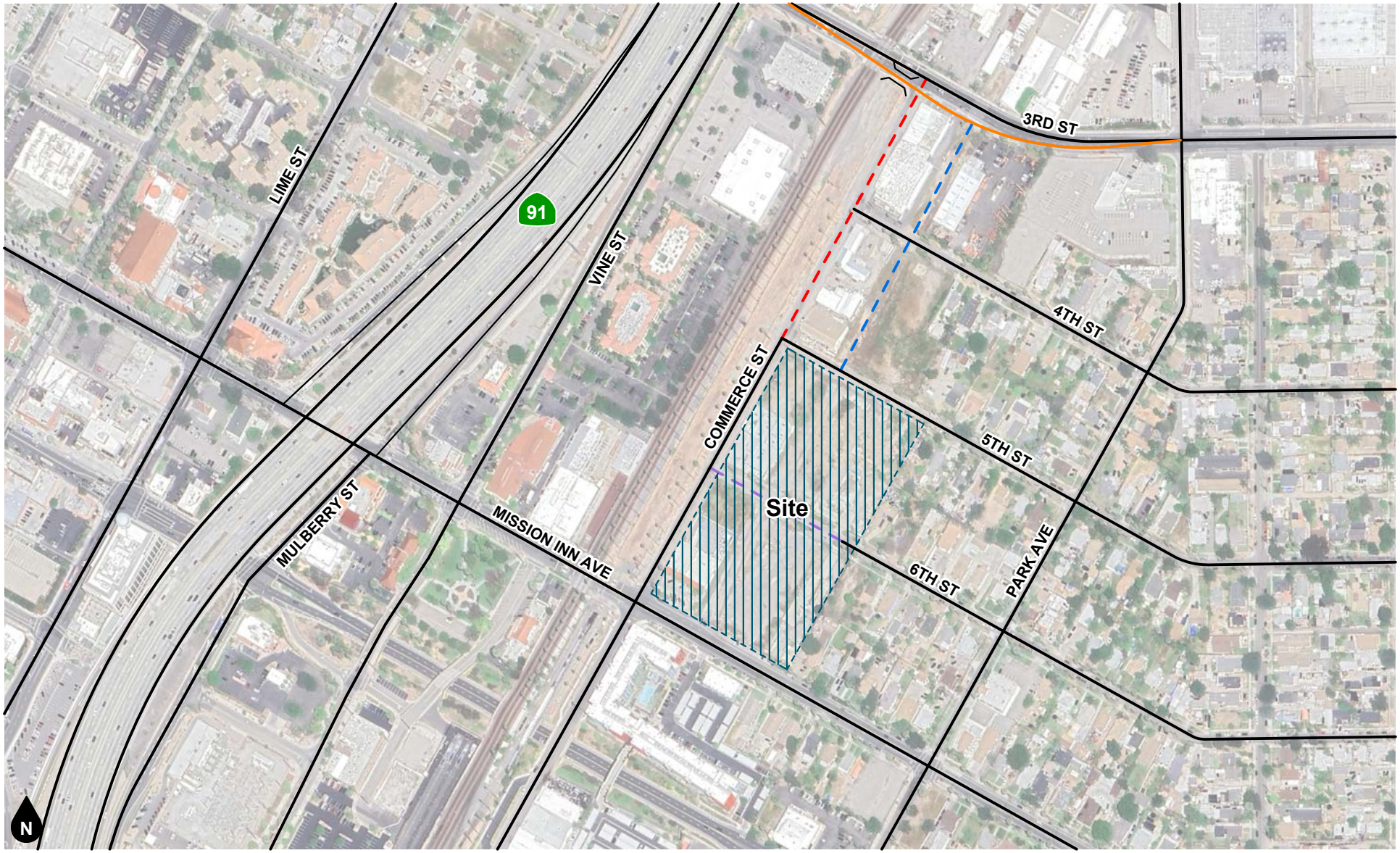
The proposed project (TTM 38624) involves removal of the existing buildings and construction of 295 mid-rise multifamily dwelling units and 5 low-rise multifamily dwelling units within a residential complex. Vehicular access for the project site is proposed via two driveways with one on 5th Street and one on Mission Inn Avenue.

The project site requires a General Plan Amendment and Zoning Amendment to rezone the site from Business & Manufacturing Park Zone (BMP) to Mixed-use Urban (MU-U) to accommodate the residential development and a Specific Plan Amendment to amend the Riverside Marketplace Specific Plan to expand the mixed-used Marketplace Sub-area. The proposed plan also includes a street vacation of 6th Street from Commerce Street to the east side of the project. Figure 2 illustrates the project site plan.

Although project construction noise impacts would not exceed applicable thresholds, the following best management practices (BMPs) can be provided on project plans and in contract specifications to minimize construction noise emanating from the proposed project:

1. All equipment, whether fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.
2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
3. As applicable, all equipment shall be shut off and not left to idle when not in use.
4. To the degree possible, equipment staging will be located in areas that create the greatest distance between construction-related noise and vibration sources and existing sensitive receptors.
5. Portable stationary noise sources will be directed away and shielded from existing residences in the vicinity of the project site. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and existing residences. The shielding should be without holes and cracks.

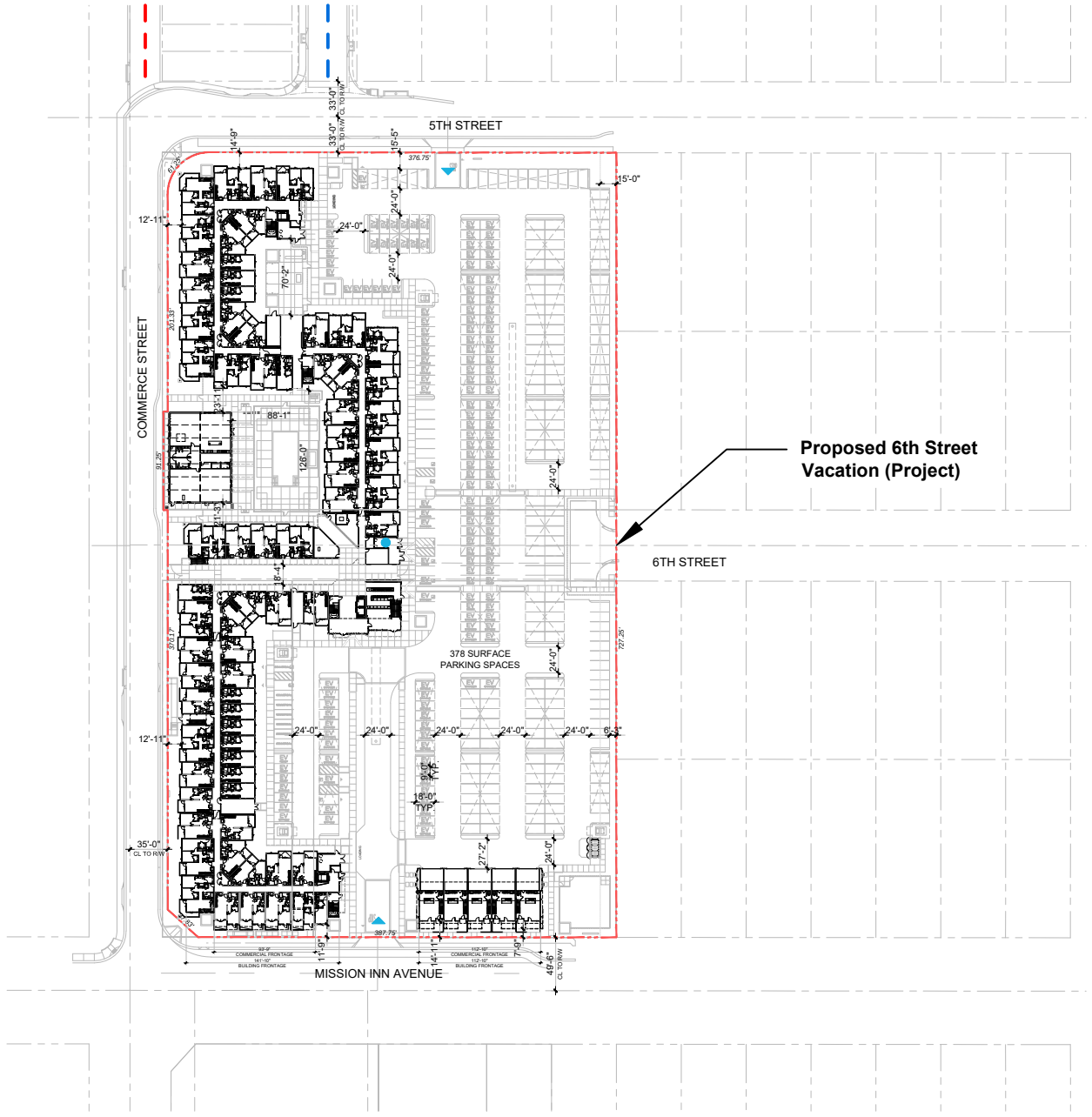
6. No amplified music and/or voice will be allowed on the project site.
7. Haul truck deliveries will not occur outside of the hours presented as exempt for construction per City of Riverside Municipal Code Section 7.35.020(G).



Legend

- Planned 3rd Street Grade Separation Project (City Project)
- Planned Commerce Street Realignment (City Project)
- Planned Commerce Street Vacation (City Project)
- Proposed 6th Street Vacation (Project)

Figure 1
Project Location Map



Planned Commerce Street Realignment (City Project)

Planned Commerce Street Vacation (City Project)

Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

This section provides an overview of key noise and vibration concepts.

NOISE FUNDAMENTALS

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Appendix B. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dB(A) or dBA.

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiates uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 3 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. For example, $L_{eq(3\text{-}hr)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (DNL). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. DNL is a very similar 24-hour average measure that weights only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013).

VIBRATION FUNDAMENTALS

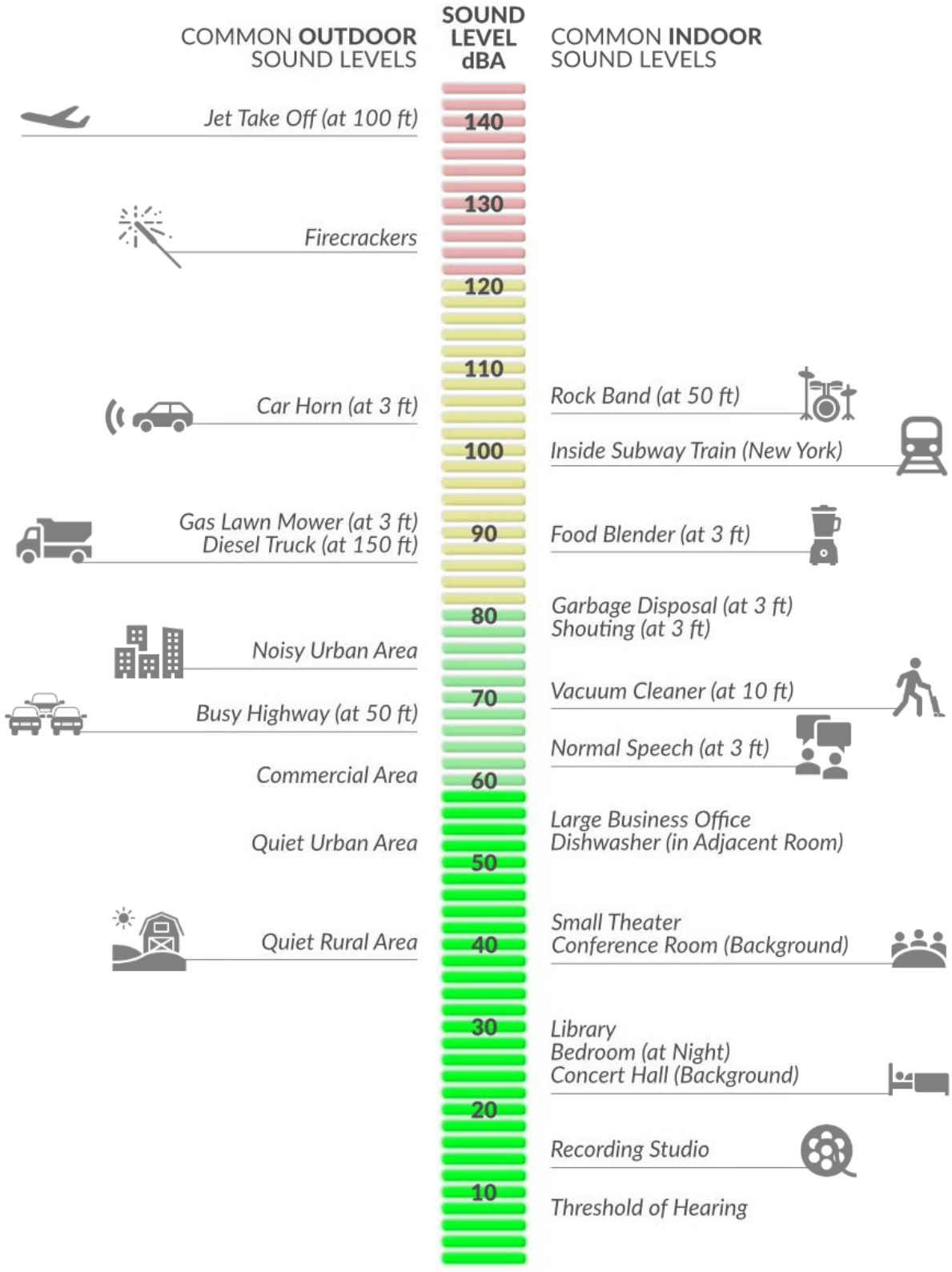
The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. There are three main types of vibration propagation: surface, compression and shear waves.

Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. Compression waves, or P-waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. Shear waves, or S-waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation".

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

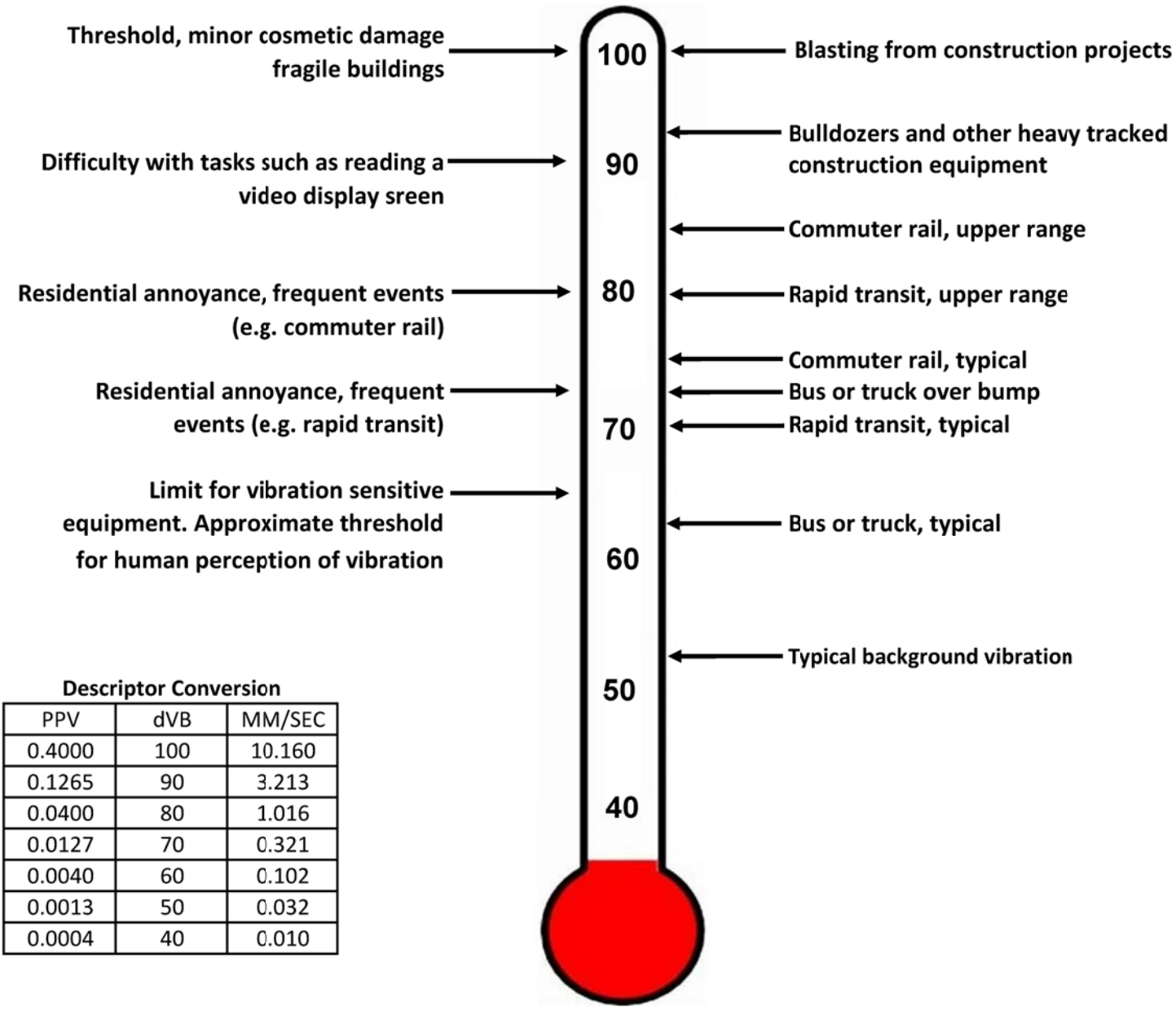
Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second. The RMS of a signal is the average of the squared amplitude of the signal in vibration decibels (VdB), ref one micro-inch per second. The Federal Railroad Administration uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

PPV is appropriate for evaluating the potential of building damage and VdB is commonly used to evaluate human response. Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval. Figure 4 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in the figure, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB and then it depends on the frequency of the event. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.



Based on Policy & Guidance from Federal Aviation Administration

Figure 3
A-Weighted Comparative Sound Levels



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Source: FRA, 2012. Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment. Office of Railroad Policy Development, Washington, D.C. DOT/FRA/ORD-12/15. September.

Figure 4
Typical Levels of Groundborne Vibration

3. EXISTING NOISE ENVIRONMENT

This section describes the existing noise setting in the project vicinity.

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by Commerce Street to the west, 5th Street to the north, Mission Inn Avenue to the south, and single-family residential uses to the east of the project site.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. Existing sensitive land uses that may be affected by project noise include the existing single-family residential uses located adjacent to the east, approximately 100 feet southeast (across Mission Inn Avenue), and approximately 65 feet northeast (across 5th Street) and the multi-family residential uses located approximately 100 feet south (across Mission Inn Avenue) of the project site. In addition, North Park is located approximately 361 feet southwest of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section SI.4 2014, Class 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, five (5) 15-minute daytime noise measurements were taken between 1:02 PM and 3:43 PM on June 1, 2023. In addition, one (1) long-term 24-hour noise measurement was also taken from June 1, 2023 to June 2, 2023. Figure 5 shows the noise measurement location map. Field worksheets and noise measurement worksheets are provided in Appendix C.

- STNM1: represents the existing noise environment of the multi-family residential use located to the south of the project site along the southern side of Mission Inn Avenue (Mission Lofts Apartments, 3050 Mission Inn Avenue). The noise meter was placed near the northern property line of the residential use just south of Mission Inn Avenue.
- STNM2: represents the existing noise environment of the single-family residential uses located just east of the project site along 6th Street (2981 6th Street). The noise meter was placed just northwest of the residential use and south of 6th Street.
- STNM3: represents the existing noise environment of the single-family residential uses located just northeast of the project site along 5th Street (2980 5th Street). The noise meter was placed just northwest of the residential use and south of 5th Street.
- STNM4: represents the existing noise environment of the single-family residential uses located to the north/northeast of the project site along 4th Street (3008 4th Street). The noise meter was placed just northwest of the residential use and south of 4th Street.
- STNM5: represents the existing noise environment of the western boundary of the project site. The noise meter was placed just southeast of the intersection of Commerce Street and 6th Street.
- LTNM1: represents the existing noise environment of the project site. The noise meter was placed within the western portion of the project site just south of 6th Street.

Table 1 provides a summary of the short-term ambient noise data. Table 2 provides hourly interval ambient noise data from the long-term noise measurements. Measured short-term ambient noise levels ranged between 56.7 and 71.7 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 53.5 to 75.6 dBA L_{eq}. The dominant noise source in the project vicinity was vehicle traffic associated with Mission

Inn Avenue, 91 Freeway, Commerce Street, and other surrounding roadways as well as train activity (i.e., moving trains, horns, and crossing bells). A Burlington Northern Santa Fe (BNSF) rail line runs parallel to the project site approximately 160 feet to the northwest of the project site. While other residential and traffic background noise is readily noticeable during non-train pass-by periods, the passing of trains at this location dominates the noise environment and is the primary contributor to the overall community equivalent noise level (CNEL). According to a United States Department of Crossing Inventory Form for this location (see Appendix D), nine passenger trains and nine freight trains (5 day plus 4 night) for a total of 18 trains per day pass by the project site per day. The trains vary in length but can be very long. Train pass-by events are also evident in the 24-hour hourly noise data collected at LTNM1. During the 24-hour measurement taken approximately 260 feet southeast of the rail line (LTNM1), a total of 45 one-minute measurements were 80 dBA or greater (up to 91.3dBA) were measured.

Table 1
Short-Term Noise Measurement Summary

Daytime Measurements (dBA)[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
STNM1	1:02 PM	71.7	94.2	52.9	75.2	67.6	63.3	58.2
STNM2	1:44 PM	62.4	82.0	53.2	71.6	61.7	58.9	56.9
STNM3	2:22 PM	56.7	63.4	54.2	59.7	58.1	57.1	56.4
STNM4	2:54 PM	58.8	64.5	56.6	61.3	60.1	59.1	58.5
STNM5	3:28 PM	64.6	87.8	54.9	71.8	65.4	61.0	59.3

Notes:
(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.
(2) Noise measurements performed on June 1, 2023.

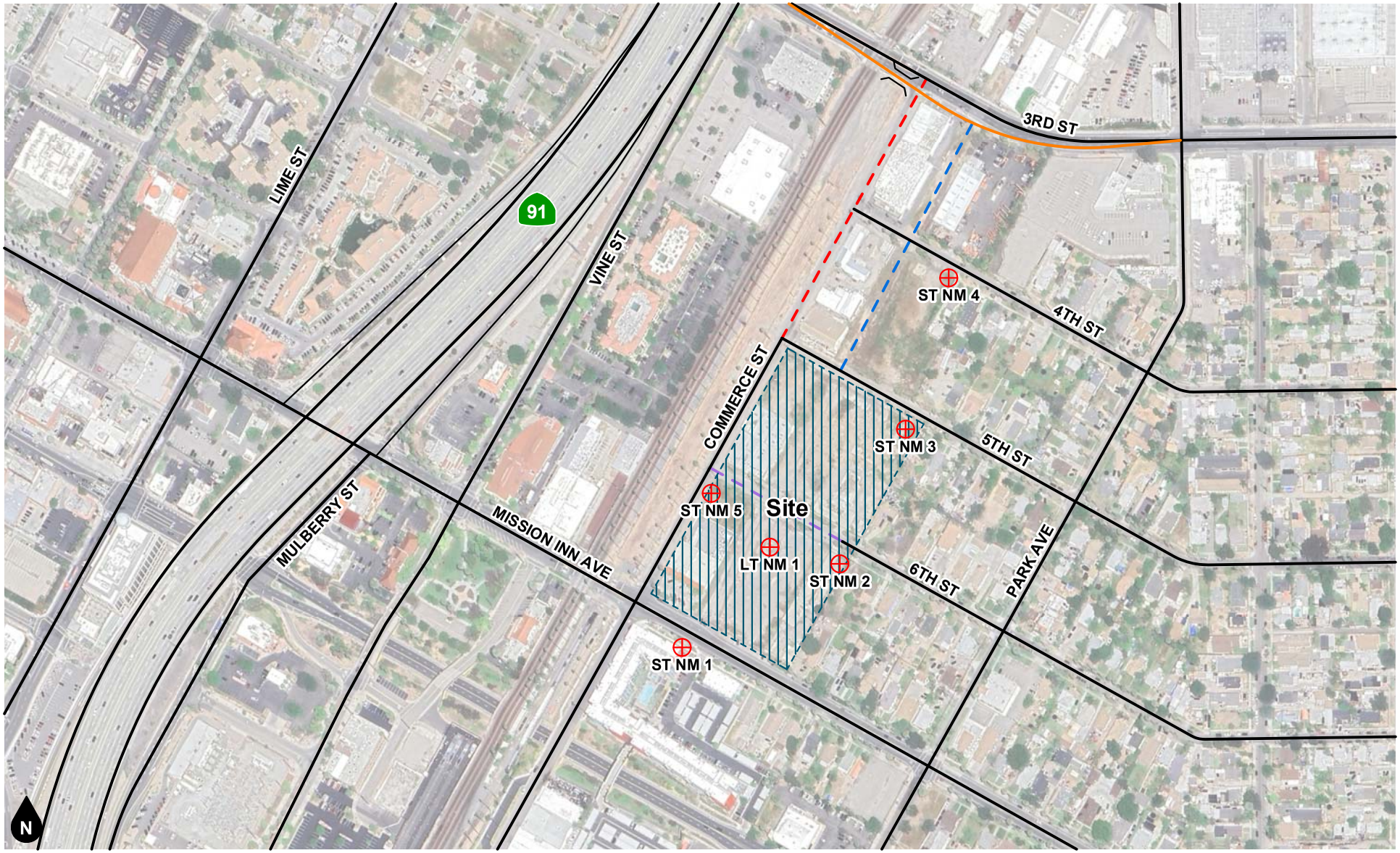
Table 2
Long-Term Noise Measurement Summary (LTNM1)

24-Hour Ambient Noise (dBA)[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	7:00 PM	70.5	101.3	46.6	73.0	64.8	59.4	56.2
1	7:00 PM	75.6	98.6	56.1	82.7	69.4	63.1	60.3
2	8:00 PM	71.5	95.7	53.4	75.7	66.1	59.5	57.8
3	9:00 PM	67.2	95.0	52.9	76.5	62.2	56.9	55.9
4	10:00 PM	68.9	94.8	51.9	73.4	61.9	56.4	55.3
5	11:00 PM	67.4	94.5	49.8	63.6	57.9	55.3	54.3
6	12:00 AM	53.5	65.0	49.7	56.6	55.2	54.1	53.1
7	1:00 AM	67.7	95.6	46.8	69.4	60.1	53.1	51.9
8	2:00 AM	71.7	96.4	46.6	78.1	67.1	55.0	52.4
9	3:00 AM	73.5	97.7	47.5	75.6	64.2	53.8	52.0
10	4:00 AM	56.5	80.5	48.0	59.8	56.5	55.3	54.3
11	5:00 AM	67.2	94.0	52.0	70.0	60.7	57.0	56.0
12	6:00 AM	68.5	95.1	53.6	67.4	62.6	57.2	56.2
13	7:00 AM	72.5	96.2	51.8	78.8	67.2	58.0	55.7
14	8:00 AM	67.1	95.8	52.9	68.7	63.8	57.6	56.6
15	9:00 AM	69.4	95.6	52.6	71.6	65.5	57.3	56.3
16	10:00 AM	67.9	95.4	48.5	71.9	64.8	56.5	54.4
17	11:00 AM	68.8	99.5	47.9	71.9	61.7	53.7	52.2
18	12:00 PM	61.0	89.6	49.9	66.7	59.3	56.6	54.6
19	1:00 PM	73.8	101.3	52.1	69.7	60.4	58.0	56.4
20	2:00 PM	72.2	98.6	53.2	79.7	68.8	60.1	57.8
21	3:00 PM	71.8	96.9	55.3	76.8	66.7	61.5	59.2
22	4:00 PM	71.4	98.3	55.1	67.7	63.5	60.6	59.6
23	5:00 PM	70.8	96.4	56.8	73.3	66.3	61.7	60.8
24	6:00 PM	71.6	95.5	58.3	77.6	68.3	62.4	61.4
CNEL	76.2							

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 24-hour duration.

(2) Noise measurement performed from June 1, 2023 to June 2, 2023.



Legend

NM 1 Noise Measurement Location

ST NM Short-Term Noise Measurement

LT NM Long-Term Noise Measurement

Figure 5
Noise Measurement Location Map

4. REGULATORY SETTING

This section documents the regulatory framework and applicable noise standards.

FEDERAL REGULATION

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

Federal Interagency Commission on Noise (FICON)

The Federal Interagency Commission on Noise (FICON) has published thresholds that can be used to assess whether a project may result in a substantial increase in noise levels where a lead agency has not adopted their own, as follows:

- If project generated vehicle traffic results in an increase of 5 dB or more where existing ambient noise levels are less than 60 dB CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 3 dB or greater where existing ambient noise levels are 60 to 65 dBA CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 1.5 dB or more where existing ambient noise levels are greater than 65 dBA CNEL at existing sensitive noise receptors.

Federal Transit Administration

Transit and Construction Noise

FTA standards and criteria for assessing noise impacts related to transit projects are based on community reactions to noise. The criteria reflect changes in noise exposure using a sliding scale where the higher the level of existing noise, the smaller increase in total noise exposure is allowed. Some land use activities are more sensitive to noise than others, such as parks, churches and residences, as compared to industrial and commercial uses. FTA Noise Impact Criteria groups sensitive land uses into the three categories described below.

(1) Category 1 – High Sensitivity: Land where quiet is an essential element of its intended purpose. Example land uses include preserved land for serenity and quiet, outdoor amphitheaters and concert pavilions, and national historic landmarks with considerable outdoor use. Recording studios and concert halls are also included in this category.

(2) Category 2 – Residential: This category is applicable all residential land use and buildings where people normally sleep, such as hotels and hospitals.
(3) Category 3 – Institutional: This category is applicable to institutional land uses with primarily daytime and evening use. Example land uses include schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also included in this category.

Most commercial or industrial uses are not considered noise-sensitive because activities within these buildings are generally compatible with higher noise levels. Business can be considered noise-sensitive if low noise levels are an important part of operations, such as sound and motion picture recording studios. Most parks used primarily for active recreation such as sports complexes and bike or running paths are not considered noise-sensitive. However, some parks (even some in dense urban areas) are primarily used for passive recreation such as reading, conversation, or meditation. These places, which may be valued as havens from the noise and rapid pace of everyday city life, are treated as noise-sensitive, and are included in land use Category 3. Non-sensitive uses do not require noise impact assessment.

Construction noise is assessed using guidance provided in the FTA Guidance Manual. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} averaged over an 8-hour period ($L_{eq\ (8\text{-}hr)}$; and the nighttime noise threshold is 70 dBA $L_{eq\ (8\text{-}hr)}$. For commercial uses, the daytime and nighttime noise threshold is 85 dBA $L_{eq\ (8\text{-}hr)}$ and for industrial uses the daytime and nighttime noise threshold is 90 dBA $L_{eq\ (8\text{-}hr)}$.

Transit and Construction Vibration

FTA has developed impact criteria for acceptable levels of groundborne noise and groundborne vibration. Criteria for ground-borne vibration are expressed in terms of rms velocity levels in VdB, and criteria for ground-borne noise are expressed in terms of A-weighted sound pressure levels in dBA. Table 3 shows that 80 VdB is the threshold for annoyance from groundborne vibration at sensitive receptors for infrequent events. The FTA also provides criteria for special buildings such as concert halls, television and recording studios, auditoriums, and theaters, which are also sensitive to vibration but do not fit into the three FTA sensitive land use categories previously described.

Ground-borne noise that accompanies the building vibration is usually perceptible only inside buildings and typically is only an issue at locations with subway or tunnel operations where there is no airborne noise path or for buildings with substantial sound insulation such as a recording studio.[1] As such, available guidelines from the FTA are utilized to assess impacts due to ground-borne vibration. The FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. As shown in Table 4, the threshold at which there is a risk to "architectural" damage to non-engineered timber and masonry buildings is a peak particle velocity (PPV) of 0.2 (94 VdB), at engineered concrete and masonry buildings a PPV of 0.3 (98 VdB), and at reinforced-concrete, steel, or timber buildings a PPV of 0.5 (102 VdB).

STATE REGULATIONS

California Code of Regulations

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2 and the California Building Code. These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, including residential buildings, are developed near major transportation noise sources, and where

[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2018, pp 108, 112.

such noise sources create an exterior noise level of 60 dB CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings the acceptable interior noise limit for new construction is 45 dB CNEL.

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project.

Local Regulations

City of Riverside General Plan

Table 5 shows the City's noise level standards related to land use compatibility. This matrix does not provide noise/land use compatibility criteria for multiple family residential land uses. For the purposes of this analysis, the noise/land use compatibility criteria for infill single family residential land uses have been used. As shown in Table 5, infill single family residential land uses are considered "normally acceptable" where noise levels are not expected to exceed 65 dB CNEL, "conditionally acceptable" between 65-75 dB CNEL, "normally unacceptable" between 75-80 dB CNEL, and "conditionally unacceptable" where noise levels are expected to exceed 80 dB CNEL. These standards apply to the proposed project itself.

The City of Riverside General Plan also includes the following objectives and policies in regard to noise which apply to the proposed project.

Objective N-1 Minimize noise levels from point sources throughout the community and, wherever possible, mitigate the effects of noise to provide a safe and healthful environment.

Policies

N-1.1 Continue to enforce noise abatement and control measures particularly within residential neighborhoods.

N-1.2 Require the inclusion of noise-reducing design features in development consistent with standards in Figure N–10 (Noise/Land Use Compatibility Criteria), Title 24 California Code of Regulations and Title 7 of the Municipal Code.

N-1.3 Enforce the City of Riverside Noise Control Code to ensure that stationary noise (Chapters 7.25 and 7.30) and noise emanating from construction activities (Section 7.35.020G.), private developments/residences and special events (Chapters 7.25 and 7.30) are minimized.

N-1.4 Incorporate noise considerations into the site plan review process, particularly with regard to parking and loading areas, ingress/egress points and refuse collection areas.

N-1.5 Avoid locating noise-sensitive land uses in existing and anticipated noise-impacted areas.

Objective N-2 Minimize the adverse effects of airport related noise through proper land use planning.

N-2.1 Ensure that new development can be made compatible with the noise environment by using noise/land use compatibility standards (Figure N–10 – Noise/Land Use Noise Compatibility Criteria) and the airport noise contour maps (found in the Riverside County Airport Land Use Compatibility Plans) as guides to future planning and development decisions.

N-2.5 Utilize the Airport Protection Overlay Zone, as appropriate, to advise landowners of special noise considerations associated with their development.

Objective N-3 Minimize ground transportation-related noise impacts.

N-3.1 Ensure that noise impacts generated by vehicular sources are minimized through the use of noise reduction features (e.g., earthen berms, landscaped walls, lowered streets, improved technology).

City of Riverside Municipal Code

Section 7.23.020 Mixed Use Development

Where a new development proposal includes a mix of residential and nonresidential uses within the same project, the interior ambient noise standard for the residential component of the project may be increased by five decibels.

Section 7.25.010 Exterior sound level limits

A. Unless a variance has been granted as provided in this title, it shall be unlawful for any person to cause or allow the creation of any noise which exceeds the following:

   a. The exterior noise standard of the applicable land use category, shown in Table 6, up to five decibels, for a cumulative period of more than 30 minutes in any hour; or
   b. The exterior noise standard of the applicable land use category, shown in Table 6, plus five decibels, for a cumulative period of more than 15 minutes in any hour; or
   c. The exterior noise standard of the applicable land use category, shown in Table 6, plus ten decibels, for a cumulative period of more than five minutes in any hour; or
   d. The exterior noise standard of the applicable land use category, shown in Table 6, plus 15 decibels, for the cumulative period of more than one minute in any hour; or
   e. The exterior noise standard for the applicable land use category, shown in Table 6, plus 20 decibels or the maximum measured ambient noise level, for any period of time.

B. If the measured ambient noise level exceeds that permissible within any of the first four noise limit categories, the allowable noise exposure standard shall be increased in five decibel increments in each category as appropriate to encompass the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

C. If possible, the ambient noise level shall be measured at the same location along the property line with the alleged offending noise source inoperative. If for any reason the alleged offending noise source cannot be shut down, then the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance that the offending noise is inaudible. If the measurement location is on the boundary between two different districts, the noise shall be the

arithmetic mean of the two districts.

D. Where the intruding noise source is an air-conditioning unit or refrigeration system which was installed prior to the effective date of this title, the exterior noise level when measured at the property line shall not exceed 60 dBA for units installed before 1-1-80 and 55 dBA for units installed after 1-1-80.

Section 7.30.015 Interior sound level limits

A. No person shall operate or cause to be operated, any source of sound indoors which causes the noise level, when measured inside another dwelling unit, school or hospital, to exceed:

1. The interior noise standard for the applicable land category area, shown in Table 7, up to five decibels, for a cumulative period of more than five minutes in any hour;
2. The interior noise standard for the applicable land use category, shown in Table 7, plus five decibels, for a cumulative period of more than one minute in any hour;
3. The interior noise standard for the applicable land use category, shown in Table 7, plus ten decibels or the maximum measured ambient noise level, for any period of time.

B. If the measured interior ambient noise level exceeds that permissible within the first two noise limit categories in this section, the allowable noise exposure standard shall be increased in five decibel increments in each category as appropriate to reflect the interior ambient noise level. In the event the interior ambient noise level exceeds the third noise limit category, the maximum allowable interior noise level under said category shall be increased to reflect the maximum interior ambient noise level.

C. The interior noise standard for various land use districts shall apply, unless otherwise specifically indicated, within structures located in designated zones with windows opened or closed as is typical of the season.

Section 7.35.020(G) Exemptions

Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as required; and provided said activities do not take place between the hours of 7:00 PM and 7:00 AM on weekdays, between the hours of 5:00 PM and 8:00 AM on Saturdays, or at any time on Sunday or a federal holiday, are exempt from the City's Nuisance noise standards presented in Tables 7.25.010A and 7.30.015 of the Municipal Code.

Table 3
Groundborne Vibration Impact Criteria for General Vibration Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)			GBN Impact Levels (dBA, 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB*	65 VdB*	65 VdB*	N/A	N/A	N/A
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35	38	43
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40	43	48

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

Notes:

*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.

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operation.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes commuter rail branch lines.

Table 4
Construction Vibration Damage Criteria

Building/Structural Category	PPV, in/sec	Approximate Lv*
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extemely susceptible to vibration damage	0.1	90

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

Notes:

*RMS velocity in decibels, VdB re 1 micro-in/sec

Table 5
Noise/Land Use Noise Compatibility Criteria

Land Use Category	Community Noise Equivalent Level (CNEL)							
	55	60	65	70	75	80	85	
Single Family Residential*								
Infill Single Family Residential*								
Commercial - Motels, Hotels, Transient Lodging								
Schools, Libraries, Churches, Hospitals, Nursing Homes								
Amphitheaters, Concert Hall, Auditorium, Meeting Hall								
Sports Arenas, Outdoor Spectator Sports								
Playgrounds, Neighborhood Parks								
Golf Courses, Riding Stables, Water Rec., Cemeteries								
Office Buildings, Business, Commercial, Professional								
Industrial, Manufacturing, Utilities, Agriculture								
Freeway Adjacent Commercial, Office, and Industrial Uses								

Normally Acceptable:	Specified land use is satisfactory, based up the assumption that any building is 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 noise reduction requirements is made and needed noise insulation features included in design. Conventional constuction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable:	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in design.
Conditionally Unacceptable:	New construction or development should generally not be undertaken, unless it can be demonstrated that noise reduction requirements can be employed to reduce noise impacts to an acceptable level. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features inluded in the design.

(1) Source: City of Riverside General Pan 2025 Noise Element Figure N-10, February 2018.

Notes:

*For properties located within airport influence areas, acceptable noise limits for single family residential uses are established by the Riverside County Airport Land Use Compatibility Plan.

Table 6
Exterior Sound Level Limits

Exterior Noise Standards		
Land Use Category	Time Period	Noise Level
Residential	Night (10:00 PM - 7:00 AM)	45 dBA
	Day (7:00 AM - 10:00 PM)	55 dBA
Office/Commercial	Any time	65 dBA
Industrial	Any time	70 dBA
Community Support	Any time	60 dBA
Public Recreation Facility	Any time	65 dBA
Nonurban	Any time	70 dBA

Land Use Category/Zoning Matrix	
Land Use Category	Underlying Zone
Residential	RE, RA-5, RR, RC, R-1-1/2 acre, R-1-13000, R-1-10500, R-1-8500, R-1-7000, R-3-25000, R-3-4000, R-3-3000, R-3-2000, R-3-1500, R-4
Office/Commercial	O, CRC, CR-NC, CR, CG
Industrial	BMP, I, AIR
Community Support	Any permitted zone
Nonurban	Any permitted zone

Source: Section 7.25.010(D) of the City of Riverside Municipal Code.

Table 7
Interior Sound Level Limits

Interior Noise Standard		
Land Use Category	Time Period	Noise Level
Residential	Night (10:00 PM - 7:00 AM)	35 dBA
	Day (7:00 AM - 10:00 PM)	45 dBA
School	7:00 AM – 10:00 PM (while school is in session)	45 dBA
Hospital	Any time	45 dBA

Source: Section 7.30.015(C) of the City of Riverside Municipal Code.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

This section discusses the analysis methodologies used to assess noise impacts.

CONSTRUCTION NOISE MODELING

Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

Construction noise associated with the proposed project was calculated at the sensitive receptor locations, utilizing methodology presented in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (2018) together with several key construction parameters, including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the project site.

The equipment used to calculate the construction noise levels for each phase were based on the assumptions provided in the California Emissions Estimator Model (CalEEMod) modeling provided in the Air Quality, Global Climate Change, HRA, and Energy Impact Analysis prepared for the proposed project (Ganddini Group, Inc., 2025). For analysis purposes, the distance measured from the project site to sensitive receptors was assumed to be the acoustical center of the project site to the property line of residential properties with existing residential buildings. Sound emission levels associated with typical construction equipment as well as typical usage factors are provided in Table 8. Construction noise worksheets are provided in Appendix E.

OPERATIONAL NOISE MODELING

SoundPLAN Noise Model

The SoundPLAN acoustical modeling software was utilized to model future traffic noise levels at proposed project sensitive uses (e.g., residences). SoundPLAN is capable of evaluating stationary noise sources (e.g., parking lots, drive-thru menus, carwash equipment, vacuums, etc.) as well as mobile noise sources (e.g., vehicle traffic and trains. The SoundPLAN software utilizes algorithms (based on the inverse square law) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations. In addition to the information provided below, noise modeling input and outputs assumptions are provided in Appendix F.

BNSF rail lines currently run parallel to the project site approximately 160 f from the northwestern property line. As discussed previously, while other residential and traffic background noise is readily noticeable, the passing of trains at this location dominates the noise environment and is the primary contributor to the CNEL. For this reason, the 24-hour noise measurement taken on the project site (LTNM1 shown on Figure 5) was used to represent rail, vehicle traffic, and other incidental noise in the project environment. Hourly measurements as well as the CNEL are provided in Table 2. A line source was calibrated in the SoundPLAN noise model to represent the measured CNEL.

Expected increases in vehicle traffic along Mission Avenue or Commerce Street would not have an impact on the overall CNEL.

Existing and Existing Plus Project Traffic Noise Levels

Noise from vehicular traffic (Existing, Existing Plus Project, and Future) was modeled using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Key model parameters and REMEL adjustments are presented below:

- Roadway classification (e.g., freeway, major arterial, arterial, secondary, collector, etc.);
- Roadway active width (distance between the center of the outer most travel lanes on each side of the roadway);
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks and heavy trucks;
- Roadway grade and angle of view;
- Site conditions (e.g., soft vs. hard); and
- Percentage of total ADT which flows each hour throughout a 24-hour period.

Traffic noise levels were calculated at the right-of-way based on distance from the centerline of the analyzed roadway. The modeling is theoretical and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the modeled noise levels are shown for comparative purposes only to show the difference between with and without project conditions. The traffic noise calculation worksheets are included in Appendix G.

Project generated vehicle traffic is expected to utilize Mission Inn Avenue, 6th Street, and 5th Street to access the project site. Existing and project average daily vehicle trips (ADTs) were provided in the *Iron Lofts Multifamily Residential Traffic Impact Analysis* (TIA) prepared for the project (Ganddini Group, January 15, 2025). Per the TIA, the project is anticipated to generate 1,425 new daily vehicle trips and 1,213 net new daily vehicle trips when taking into consideration the reduction of existing uses. Table 9 includes the modeled roadway segments as well as the average daily traffic volumes, posted speed limits, and vehicle mix utilized in this analysis.

GROUNDBORNE VIBRATION MODELING

Groundborne vibration modeling was performed using vibration propagation equations and construction equipment source levels obtained from the FTA *Transit Noise and Vibration Impact Assessment Manual* (2018). Table 10 shows typical vibration levels associated with commonly used construction equipment based on data from the FTA.

There are several types of construction equipment that can cause vibration levels high enough to annoy persons in the vicinity and/or result in architectural or structural damage to nearby structures and improvements. For example, as shown in Table 10, a vibratory roller could generate up to 0.21 in/sec PPV at and operation of a large bulldozer could generate up to 0.089 PPV at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 in/sec PPV. It should be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment. Groundborne vibration calculations are provided in Appendix H.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{equipment} = PPV_{ref} (25/D_{rec})^{n}$$

Where: PPV_{ref} = *reference PPV at 25ft.*
D_{rec} = *distance from equipment to receiver in ft.*
n = 1.5 (*the value related to the attenuation rate through ground*)

Table 8 (1 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-N/A-	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-N/A-	0
Blasting	Yes	-N/A-	94	-N/A-	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-N/A-	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Forklift[2,3]	No	50	n/a	61	n/a
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-N/A-	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-N/A-	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	50	85	77	9
Paving Equipment	No	50	85	77	9
Pneumatic Tools	No	50	85	85	90

Table 8 (2 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-N/A-	0
Tractor	No	40	84	-N/A-	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Notes:

(1) Source: FHWA Roadway Construction Noise Model User's Guide January 2006.

(2) Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/

(3) Data provided Leq as measured at the operator. Sound Level at 50 feet is calculated using Inverse Square Law.

Table 9
Project Average Daily Traffic Volumes and Roadway Parameters

Roadway	Segment	Average Daily Traffic Volume[1]		Posted Travel Speeds (MPH)	Site Conditions
		Existing	Existing Plus Project		
Lime Street	South of Mission Inn Avenue	11,200	11,350	35	Hard
Mulberry Street	South of Mission Inn Avenue	5,500	5,650	35	Hard
Commerce Street	3rd Street to 5th Street	1,000	1,120	25	Hard
	5th Street to Mission Inn Avenue	1,000	1,200	25	Hard
	South of Mission Inn Avenue	2,000	2,060	25	Hard
Mission Inn Avenue	West of Lime Stret	9,800	9,980	25	Hard
	Lime Street to Mulberry Street	14,000	14,330	35	Hard
	Mulberry Street to Vine Street	8,100	8,830	35	Hard
	Vine Street to Commerce Street	6,000	6,630	35	Hard
	East of Commerce Street	4,600	5,330	35	Hard
	West of Park Avenue	4,300	4,360	35	Hard
	East of Park Avenue	2,700	2,760	35	Hard
6th Street	Project Site to Park Avenue	100	200	25	Hard
5th Street	East of Commerce Stret	200	520	25	Hard
	West of Park Avenue	100	220	25	Hard
3rd Street	West of Commerce Street	18,700	18,760	30	Hard
	East of Commerce Street	18,300	18,360	40	Hard

Vehicle Distribution (Light Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.56	13.96	10.49
Medium Trucks	48.91	2.17	48.91
Heavy Trucks	47.30	5.41	47.30

Vehicle Distribution (Heavy Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.54	14.02	10.43
Medium Trucks	48.00	2.00	50.00
Heavy Trucks	48.00	2.00	50.00

Notes:

(1) Existing and project average daily traffic volumes for all roadways were obtained from the Iron Lofts Multifamily Residential Project Traffic Impact Analysis, Ganddini Group Inc. (January 15, 2025).

(2) Existing vehicle percentages are based on the Riverside County Industrial Hygiene Letter for Traffic Noise.

Table 10
Construction Equipment Vibration Source Levels

Equipment		PPV at 25 ft, in/sec	Approximate Lv* at 25 ft
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.170	93
clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment Manual, 2018.
*RMS velocity in decibels, VdB re 1 micro-in/sec

6. NOISE AND VIBRATION IMPACTS

This section analyzes the significance of project-related noise and groundborne vibration impacts relative to standards established by the City of Riverside and other applicable agencies in the context of CEQA. Appendix G of the California Environmental Quality Act Guidelines (Title 14, Division 6, Chapter 3 of the California Code of Regulations) includes an environmental checklist that identifies issues upon which findings of significance should be made. The CEQA Environmental Checklist Appendix G, XIII. Noise, requires determination if the project would result in:

a) *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?*

b) *Generation of excessive groundborne vibration or groundborne noise levels?*

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 project expose people residing or working in the area to excessive noise levels?*

NOISE IMPACTS

Would the project result in:

a) *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?*

Finding: Less Than Significant With Mitigation

In relation to the Environmental Checklist noise issue "a", applicable standards established by the City of Riverside can be categorized into the following areas:

- Construction Noise
- Operational Noise

Project Construction

On-Site Equipment

Construction noise is regulated within the City of Riverside Municipal Code Section 7.35.020(G), which prohibits construction activities outside the hours of hours of 7:00 AM to 7:00 PM on weekdays, 8:00 AM to 5:00 PM on Saturdays, or at any time on Sundays or federal holidays. However, neither the City of Riverside General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA consists as a *substantial temporary or periodic noise increase*. Therefore, a numerical construction noise threshold based on the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of

standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime (7:00 AM to 10:00 PM) exterior construction noise level of 80 dBA L_{eq} for noise sensitive residential land uses and 85 dBA L_{eq} for commercial uses. In addition, the FTA considers a nighttime (10:00 PM to 7:00 AM) exterior construction noise level of 70 dBA L_{eq} for noise sensitive residential land uses and 85 dBA L_{eq} for commercial uses.

Accordingly, the project would result in a significant impact if:

- Project construction occurs outside the hours of 7:00 AM to 7:00 PM on weekdays; 8:00 AM and 5:00 PM on Saturdays; at anytime on Sundays or federal holidays; or,
- Project construction noise exceeds 80 dBA L_{eq} during the daytime (7:00 AM to 10:00 PM) or 70 dBA L_{eq} during the nighttime (10:00 PM to 7:00 AM) at residential uses; or,
- Project construction noise exceeds 85 dBA L_{eq} during the daytime (7:00 AM to 10:00 PM) or nighttime (10:00 PM to 7:00 AM) at commercial uses.

Project construction noise levels at nearby sensitive receptors were calculated using the FTA methodology. Construction noise modeling worksheets for each phase are provided in Appendix E. Anticipated noise levels during each construction phase are presented in Table 11.

As shown in Table 11, modeled construction noise levels are forecast to reach up to 69.2 dBA L_{eq} at the nearest existing commercial property line to the northwest, 68 dBA L_{eq} at the nearest existing residential property line to the northeast, 75.2 dBA L_{eq} at the nearest existing residential property line to the east, 68 dBA L_{eq} at the nearest existing residential property line to the southeast, 68.6 dBA L_{eq} at the nearest existing residential property line to the south, 67 dBA L_{eq} at the nearest existing commercial property line to the southwest, and 72.3 dBA L_{eq} at the nearest existing commercial property line to the west of the project site.

Based on the modeled construction noise levels (see Appendix E), construction noise levels will not exceed the daytime FTA residential construction noise standards of 80 dBA L_{eq} for residential uses and 85 dBA L_{eq} for commercial uses. In addition, the modeled construction noise levels do not exceed the nighttime FTA construction noise threshold of 85 dBA L_{eq} for commercial uses. However, the nighttime FTA construction noise threshold of 70 dBA L_{eq} for residential uses will potentially be exceeded at the residential uses to the east of the project site if construction activities occur between 10:00 PM and 7:00 AM.

Project construction will not occur outside of the hours outlined in the City of Riverside Municipal Code Section 7.35.020(G) (7:00 PM to 7:00 AM on weekdays and 5:00 PM and 8:00 AM on Saturdays); therefore, the project would not undergo construction activities during the FTA noise sensitive nighttime hours of 10:00 PM and 7:00 AM. Therefore, the project is not expected to exceed established standards relating to construction noise. The project impact would be less than significant, no mitigation is required.

Notwithstanding the above, best management practices (BMPs) provided in the Project Description can be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Off-Site Vehicle Trips

Neither the City of Riverside's General Plan nor the City's Municipal Code establishes quantitative thresholds for the increase in ambient noise levels associated with project generated vehicle trips during project construction. According to the FHWA, traffic volumes would need to double in order to result in a barely perceptible increase in noise levels (3 dBA)[2]. As discussed in Section 4 of this report, the FICON has published thresholds that can be used to assess whether project generated transportation noise may result in a substantial increase in noise levels. Existing measured ambient noise levels along Mission Inn Avenue and

[2] Federal Highway Administration, Highway Noise Prediction Model, December 1978.

Commerce Street in the vicinity of the project site were 71.7 dBA L_{eq} and 64.6 dBA L_{eq}, respectively. Therefore, a project traffic induced noise increase of 3 dBA or more may be considered to be substantial.

Construction truck trips would occur throughout the construction period. Mission Inn Avenue currently handles between approximately 2,700 and 14,00 average daily vehicle trips and Commerce Street handles between approximately 1,000 to 2,000 average daily vehicle trips in the vicinity of the project site.[3] According to the *Iron Lofts Multifamily Residential Project Air Quality, Global Climate Change, Health Risk Assessment, and Energy Impact Analysis* (Ganddini Group, Inc., 2023), the greatest number of construction-related vehicle trips per day would be during building construction at up to approximately 248 vehicle trips per day (216 for worker trips and 32.1 for vendor trips). Given the project site's proximity to 91 Freeway, it is anticipated that vendor and/or haul truck traffic would take the most direct route to the appropriate freeway ramps. Therefore, the addition of project vendor/haul trucks and worker vehicles per day along off-site roadway segments would not be anticipated to result in a doubling of traffic volumes necessary to increase noise levels by 3 dBA. Off-site project generated construction vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

Project Operational Noise

Offsite Operational Noise Sources

Neither the City of Riverside's General Plan nor the City's Municipal Code establishes quantitative thresholds for the increase in ambient noise levels associated with project generated vehicle trips which would allow for a quantified determination of what would qualify as a *substantial temporary or periodic noise increase* under CEQA. Project generated vehicle traffic will result in incremental increases in noise levels along affected road segments.

The City of Riverside General Plan establishes that noise levels of up to 60 dBA CNEL are considered "normally acceptable" and of up to 65 dBA CNEL are considered "conditionally acceptable" for single-family residential; noise levels of up to 65 dBA CNEL are considered "normally acceptable" and of up to 75 dBA CNEL are considered "conditionally acceptable" for infill single-family residential; noise levels of up to 60 dBA CNEL are considered "normally acceptable" and of up to 70 dBA CNEL are considered "conditionally acceptable" for commercial uses; and noise levels of up to 70 dBA CNEL are considered "normally acceptable" and of up to 80 dBA CNEL are considered "conditionally acceptable" for industrial uses (Table 5).

California courts have rejected use of what is effectively a single "absolute noise level" threshold of significance (e.g., exceed 65 dBA CNEL) on the grounds that the use of such a threshold fails to consider the magnitude or severity of increases in noise levels attributable to the project in different environments (see *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814). California courts have also upheld the use of "ambient plus increment" thresholds for assessing project noise impacts as consistent with CEQA, noting however, that the severity of existing noise levels should not be ignored by incorporating a smaller incremental threshold for areas where existing ambient noise levels were already high (see *Mission Bay Alliance v. Office of Community Investment and Infrastructure* (2016) 6 Cal.App.5th 160).

Based on the case described above, it is important to consider impacts in light of the existing ambient noise levels and the adopted agency standards, which in this case includes the City's compatibility standards. Furthermore, it is widely accepted that the average healthy human ear can barely perceive changes of 3 dBA in an outdoor environment and that a change of 5 dBA is readily perceptible.[4]

[3] Existing average daily traffic volumes obtained from the *Iron Lofts Multifamily Residential Project Traffic Impact Analysis* (Ganddini Group, Inc., January 15, 2025).

[4] California Department of Transportation's *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013)

As stated previously, FICON has published thresholds that can be used to assess whether a project may result in a substantial increase in noise levels where a lead agency has not adopted their own, as follows:

- If project generated vehicle traffic results in an increase of 5 dB or more where existing ambient noise levels are less than 60 dB CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 3 dB or greater where existing ambient noise levels are 60 to 65 dBA CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 1.5 dB or more where existing ambient noise levels are greater than 65 dBA CNEL at existing sensitive noise receptors.

Roadway noise levels were calculated at roadways included in the *Iron Lofts Multifamily Residential Project Traffic Impact Analysis* (Ganddini Group, Inc., January 15, 2025) based on the FHWA Traffic Noise Prediction Model methodology. During operation, the proposed project is expected to generate approximately 1,213 net average daily trips with 90 trips during the AM peak-hour and 72 trips during the PM peak-hour. Roadway noise levels were calculated for the following scenarios:

- *Existing (without Project)*: This scenario refers to existing year traffic noise conditions.
- *Existing Plus Project*: This scenario refers to existing year plus project traffic noise conditions.

Table 12 shows the change in existing roadway noise levels with the addition of project-generated operational trips. FHWA Traffic Noise Prediction Model calculation worksheets are provided in Appendix G.

Modeled existing traffic noise levels range between 46-75 dBA CNEL and the modeled Existing Plus Project traffic noise levels range between 49-75 dBA CNEL at the right-of-way of each study roadway segment. The addition of project trips is not expected to change noise levels in excess of the applicable threshold at any of the study roadway segments (see Table 12). The project impact is less than significant; no mitigation is required.

Transportation Source Noise Impacts to the Project

As shown in Table 5, per the City of Riverside General Plan noise levels of up to 60 dBA CNEL are considered "normally acceptable" and up to 65 dBA CNEL are considered "conditionally acceptable" for residential uses. Facades with anticipated noise levels of 65 dBA CNEL are expected to have interior noise levels that do not exceed 45 dBA CNEL. This is based on the assumption that heating and ventilation systems will be provided in order to allow for a windows-closed condition.

As shown in Figure 6, transportation related noise is expected to range between 61 and 72 dBA CNEL at the proposed residential buildings. As shown in Table 5, development of infill residential land uses are considered to be "normally acceptable" in areas where noise levels reach up to 65 dBA CNEL. With implementation of the following mitigation measures.

Mitigation Measure 1
Windows and glass doors shall have STC ratings as presented in Table 13. Where no STC is listed, standard windows that meet California Building Code requirements will suffice.

GROUNDBORNE VIBRATION IMPACTS

Would the project result in:

b) Generation of excessive groundborne vibration or groundborne noise levels?

Finding: Less Than Significant

In relation to the Environmental Checklist noise issue "b", the City of Riverside has not established thresholds of significance concerning groundborne vibration. In the absence of City-established thresholds, groundborne vibration impacts are based on guidance from the *Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual* (FTA, September 2018) (see Regulatory Setting section). Accordingly, the project would result in a significant impact if:

- Groundborne vibration levels generated by the project have the potential to cause architectural damage at nearby buildings by exceeding the following PPV:
  - 0.10 in/sec (90 VdB) at buildings extremely susceptible to vibration damage
  - 0.20 in/sec (94 VdB) at non-engineered timber and masonry buildings
  - 0.30 in/sec (98 VdB) at engineered concrete and masonry (no plaster) buildings
  - 0.50 in/sec (102 VdB) at reinforced-concrete, steel or timber (no plaster) buildings
- Groundborne vibration levels generated by the project have the potential to cause annoyance at sensitive receptors by exceeding 80 VdB.

Groundborne vibration modeling worksheets are provided in Appendix H.

Construction-Related Vibration Impacts

Existing structures in the immediate vicinity of the project site include the residential buildings located as close as approximately 15 feet to the east, 34 feet to the east, 79 feet to the east, 118 feet to the southeast, and 104 feet to the south and the commercial building located as close as approximately 55 feet to the northwest of the project site boundaries).

Groundborne vibration levels associated with project construction are provided in Table 14. As shown in Table 14, the threshold of 0.2 PPV in/sec will be exceeded at the residential uses to the east (along 5th Street and 6th Street) of the project site. The following measure is recommended to ensure groundborne vibration generated by project construction does not cause architectural damage or severe annoyance to nearby buildings:

> **Mitigation Measure 2**
> The use of vibrator rollers, or other similar vibratory equipment, within 26 feet of residential structures surrounding the project site is to be prohibited.

The threshold for annoyance due to vibration (80 VdB at offsite sensitive uses) could be exceeded at the existing residential land uses surrounding the project site and residents may be temporarily annoyed. However, the impact would only occur when construction equipment is operating within 74 feet of the residential structures and only during daytime hours and will be temporary.

Therefore, project construction would not result in the exposure of persons to excessive groundborne vibration and impacts would be less than significant with incorporation of mitigation measure 2.

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction.

Rail-Related Vibration Impacts

The proposed project site is located approximately 170 feet southeast of the BNSF rail line. The closest proposed building is approximately 12 feet from the property line. Using the Generalized Ground Surface Vibration Equation provided in the FTA Transit Noise and Vibration Assessment Manual (2018), groundborne vibration associated with freight rail pass-bys would reach up to 53 VdB at the nearest proposed building which falls below any of the FTA criteria for potential damage to buildings. This impact would be less than significant. No mitigation is necessary.

As shown in Table 3, potential annoyance inside the proposed residential buildings would be at a level of 80 Vdb (0.04 PPV inches per second). As stated above, rail induced groundborne vibration would not exceed 53 VdB and therefore, impacts related to annoyance would be less than significant. No mitigation is required.

AIR TRAFFIC IMPACTS

Would the project result in:

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 project expose people residing or working in the area to excessive noise levels?*

Finding: No Impact

The closest airports to the project site are the Flabob Airport, with airport runways located as close as approximately 2.29 miles to the northwest of the project site, and the Riverside Municipal Airport, with airport runways located as close as approximately 4.4 miles to the southwest of the project site. Per the Riverside County Airport Land Use Compatibility Plan (ALUCP) Policy Document Map FL-3 (December 2004), the project site is well outside the 55 dBA CNEL noise contour for the Flabob Airport. The Riverside County ALUCP Policy Document (March 2005) Map RI-3, shows that the project site is also well outside the 55 dBA CNEL noise contour for the Riverside Municipal Airport.[5] The project would not expose people residing or working in the project area to excessive noise levels associated with airports. This impact would be less than significant. No mitigation is required.

[5] https://rcaluc.org/Plans/New-Compatibility-Plan

Table 11 (1 of 2)
Construction Noise Levels

Receptor Location	Construction Noise Levels (dBA Leq)	Applicable Daytime FTA Threshold (dBA Leq)[2]	FTA Threshold Exceeded?	Applicable Nighttime FTA Threshold (dBA Leq)[2]	FTA Threshold Exceeded?
Demolition					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	67.3	85	No	85	No
Residential to Northast (2981 5th St)	65.0	80	No	70	No
Residential to East (2981 6th St)	69.4	80	No	70	No
Residential to East (2968 6th St)	69.6	80	No	70	No
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	66.7	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	68.6	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	67.0	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	72.3	85	No	85	No
Commercial to West (3550 Vine St)	72.0	85	No	85	No
Site Preparation					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	69.2	85	No	85	No
Residential to Northast (2981 5th St)	68.0	80	No	70	No
Residential to East (2981 6th St)	75.2	80	No	70	Yes
Residential to East (2968 6th St)	75.0	80	No	70	Yes
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	68.0	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	68.4	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	65.8	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	69.3	85	No	85	No
Commercial to West (3550 Vine St)	69.3	85	No	85	No
Grading					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	68.8	85	No	85	No
Residential to Northast (2981 5th St)	67.7	80	No	70	No
Residential to East (2981 6th St)	74.8	80	No	70	Yes
Residential to East (2968 6th St)	74.6	80	No	70	Yes
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	67.6	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	68.0	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	65.4	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	69.0	85	No	85	No
Commercial to West (3550 Vine St)	68.9	85	No	85	No
Building Construction					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	67.4	85	No	85	No
Residential to Northast (2981 5th St)	66.3	80	No	70	No
Residential to East (2981 6th St)	73.4	80	No	70	Yes
Residential to East (2968 6th St)	73.3	80	No	70	Yes

Table 11 (2 of 2)
Construction Noise Levels

Receptor Location	Construction Noise Levels (dBA Leq)	Applicable Daytime FTA Threshold (dBA Leq)[2]	FTA Threshold Exceeded?	Applicable Nighttime FTA Threshold (dBA Leq)[2]	FTA Threshold Exceeded?
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	66.2	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	66.6	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	64.0	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	67.6	85	No	85	No
Commercial to West (3550 Vine St)	67.5	85	No	85	No
Paving					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	62.9	85	No	85	No
Residential to Northast (2981 5th St)	61.8	80	No	70	No
Residential to East (2981 6th St)	68.9	80	No	70	No
Residential to East (2968 6th St)	68.8	80	No	70	No
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	61.7	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	62.1	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	59.5	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	63.1	85	No	85	No
Commercial to West (3550 Vine St)	63.0	85	No	85	No
Architectural Coating					
Commercial to Northwest (Gilmore's, 3496 Commerce St)	55.5	85	No	85	No
Residential to Northast (2981 5th St)	54.3	80	No	70	No
Residential to East (2981 6th St)	61.5	80	No	70	No
Residential to East (2968 6th St)	61.3	80	No	70	No
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Ave)	54.2	80	No	70	No
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	54.7	80	No	70	No
Commercial to Southwest (Mission Career College, 3750 Santa Fe Ave)	52.1	85	No	85	No
Commercial to West (Safeway Electric, 3133 Mission Inn Ave)	55.6	85	No	85	No
Commercial to West (3550 Vine St)	55.6	85	No	85	No

Notes:

(1) Construction noise worksheets are provided in Appendix D.

(2) The FTA considers a daytime exterior construction noise level of 80 dBA Leq for noise sensitive residential land uses and 85 dBA Leq for commercial uses. In addition, the FTA considers a nighttime exterior construction noise level of 70 dBA Leq for noise sensitive residential land uses and 85 dBA Leq

Table 12
Increase in Existing Noise Levels Due to Project Generated Vehicle Traffic

Roadway	Segment	Distance from roadway centerline to ROW (feet)[1]	Modeled Noise Levels (dBA CNEL)[2]					
			Existing Without Project	Existing Plus Project	Change in Noise Level	Applicable Increase Threshold (dB)	Normally Acceptable Standard?[3]	Significant Impact?
Lime St	South of Mission Inn Ave	44	72.4	72.5	0.06	1.5	60	No
Mulberry St	South of Mission Inn Ave	33	66.1	66.2	0.12	1.5	60	No
Commerce St	3rd St to 5th St	33	55.9	56.4	0.50	5	60	No
	5th St to Mission Inn Ave	33	55.9	56.7	0.80	5	60	No
	South of Mission Inn Ave	33	58.9	59.0	0.13	5	60	No
Mission Inn Ave	West of Lime Stret	50	69.5	69.5	0.08	1.5	60	No
	Lime St to Mulberry St	50	72.8	72.9	0.10	1.5	60	No
	Mulberry St to Vine St	50	70.5	70.8	0.37	1.5	60	No
	Vine St to Commerce St	50	69.2	69.6	0.43	1.5	60	No
	East of Commerce St	50	68.0	68.6	0.64	1.5	60	No
	West of Park Ave	50	67.7	67.8	0.06	1.5	60	No
	East of Park Ave	50	65.7	65.8	0.09	1.5	60	No
6th St	Project Site to Park Ave	33	45.9	48.9	3.01	5	60	No
5th St	East of Commerce St	33	48.9	53.1	4.15	5	60	No
	West of Park Ave	33	45.9	49.3	3.43	5	60	No
3rd St	West of Commerce St	44	73.8	73.8	0.02	1.5	60	No
	East of Commerce St	44	75.4	75.4	0.01	1.5	60	No

Notes:

(1) Roadway right-of-way (ROW) from Figure CCM-2, Standard Roadway Cross Section, in the City of Riverside General Plan Circulation and Community Mobility Element (November 2007).

(2) Exterior noise levels calculated 5 feet above pad elevation, perpendicular to subject roadway at right-of-way (ROW).

(3) Per the City of Riverside normally acceptable standard for single-family detached residential dwelling units of 60 dBA CNEL (see Table 5).

Table 13
Required STC Rating for Windows and Glass Doors

Representative Receptors[1]	Floor Level	Noise Level (dBA CNEL)	Required STC Rating for Windows and Glass Doors
1	1	73	31
	2	74	32
	3	74	32
	4	75	33
2	1	67	25
	2	69	27
3	1	79	37
	2	79	37
	3	80	38
	4	81	39
4	1	78	36
	2	79	37
	3	80	38
	4	80	38
5	1	78	36
6	1	78	36
	2	79	37
	3	79	37
	4	80	38
7	1	74	32
	2	74	32
	3	75	33
	4	76	34
8	1	56	14
	2	56	14
	3	56	14
	4	57	15
9	1	68	26
	2	69	27
	3	71	29
	4	74	32

1. See Figure 6 for Receptor Locations

Table 14
Construction Vibration Levels at the Nearest Receptors

Receptor Location	Distance from Property Line to Nearest Structure (feet)	Equipment	Vibration Level[1]	Threshold Exceeded?[2]	Vibration Level with Mitigation[1,3]	Threshold Exceeded with Mitigation?[2]
Architectural Damage Analysis						
Residential to East (2981 5th St)	79	Vibratory Roller	0.037	No	-	-
	79	Large Bulldozer	0.016	No	-	-
Residential to East (2980 5th St)	15	Vibratory Roller	0.452	Yes	0.198	No
	15	Large Bulldozer	0.191	No	-	-
Residential to East (2981 6th St)	15	Vibratory Roller	0.452	Yes	0.198	No
	15	Large Bulldozer	0.191	No	-	-
Residential to East (2968 6th St)	79	Vibratory Roller	0.037	No	-	-
	79	Large Bulldozer	0.016	No	-	-
Residential to East (2981 Mission Inn Ave)	34	Vibratory Roller	0.132	No	-	-
	34	Large Bulldozer	0.056	No	-	-
Residential to Southeast (4 Word Sober Living Homes, 2992 Mission Inn Ave)	118	Vibratory Roller	0.020	No	-	-
	118	Large Bulldozer	0.009	No	-	-
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	104	Vibratory Roller	0.025	No	-	-
	104	Large Bulldozer	0.010	No	-	-
Commerical to Northwest (Gilmore's, 3496 Commerce St)	55	Vibratory Roller	0.064	No	-	-
	55	Large Bulldozer	0.027	No	-	-
Annoyance Analysis						
Residential to East (2981 5th St)	79	Vibratory Roller	79	Yes	-	-
	79	Large Bulldozer	72	No	-	-
Residential to East (2980 5th St)	15	Vibratory Roller	101	Yes	-	-
	15	Large Bulldozer	94	Yes	-	-
Residential to East (2981 6th St)	15	Vibratory Roller	101	Yes	-	-
	15	Large Bulldozer	94	Yes	-	-
Residential to East (2968 6th St)	79	Vibratory Roller	79	Yes	-	-
	79	Large Bulldozer	72	No	-	-
Residential to East (2981 Mission Inn Ave)	34	Vibratory Roller	90	Yes	-	-
	34	Large Bulldozer	83	Yes	-	-
Residential to Southeast (4 Word Sober Living Homes, 2992 Mission Inn Ave)	118	Vibratory Roller	74	Yes	-	-
	118	Large Bulldozer	67	No	-	-
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Ave)	104	Vibratory Roller	75	Yes	-	-
	104	Large Bulldozer	68	No	-	-

Notes:

(1) Vibration levels are provided in PPV in/sec for architectural damage and VdB for annoyance.

(2) The FTA identifies the threshold at which there is a risk to "architectural" damage to non-engineered timber and masonry buildings as a PPV of 0.2 in/sec (see Table 4). In addition, the FTA identifies a vibration annoyance threshold of 72 VdB for residential uses (see Table 3). Per the FTA Transit Noise and VIbration Impact Assessment Manual (September 2018), commercial uses are not considered vibration-sensitive land uses; therefore, the annoyance threshold does not apply to

(3) The mitigation measure needed for architectural damage would include prohibiting the use of vibratory rollers, or other similar vibratory equipment, within 26 feet of residential structures surrounding the project site.

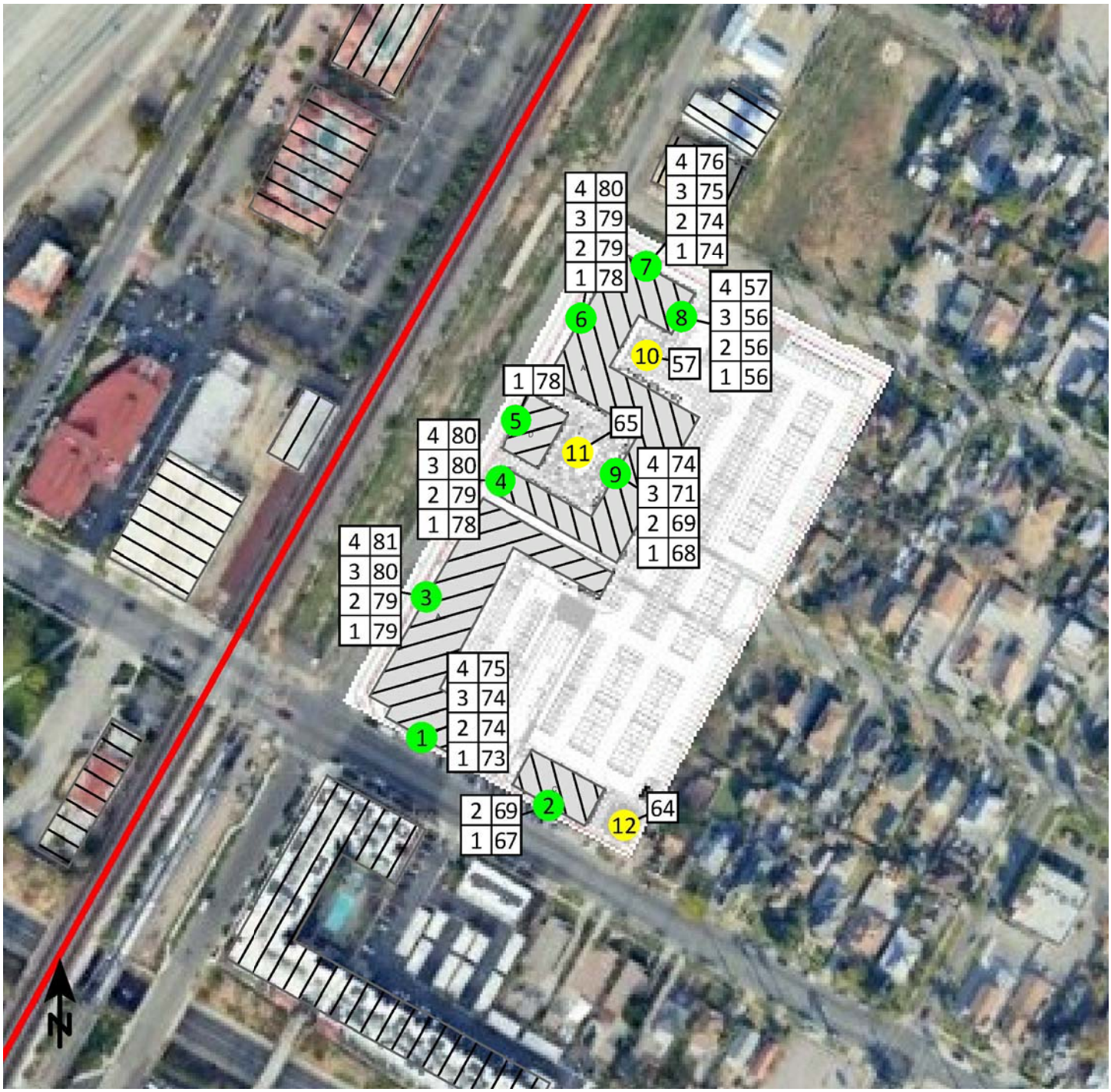


Figure 6
Transportation Noise Levels (dBA CNEL)

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2009 County of Riverside Industrial Hygiene Guidelines for Determining and Mitigating Traffic Noise Impacts to Residential Structures and County.
2015 County of Riverside General Plan
2015 County of Riverside Municipal Code.

South El Monte, City of
2023 Municipal Code

Stautins, Carl
2014 Warehouse & Forklift Noise Exposure – Noise Testing. November 4, 2014.

U.S. Department of Transportation
2006 FHWA Roadway Construction Noise Model User's Guide. January.

APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Crossing Inventory Form
Appendix E Construction Noise Model Worksheets
Appendix F SoundPLAN Worksheets
Appendix G FHWA Traffic Noise Model Worksheets
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APPENDIX A

LIST OF ACRONYMS

Term	Definition
ADT	Average Daily Traffic
ANSI	American National Standard Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA/DD	Decibel per Double Distance
dBA L_{eq}	Average Noise Level over a Period of Time
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
L_{02},L_{08},L_{50},L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
DNL	Day-Night Average Noise Level
$L_{eq(x)}$	Equivalent Noise Level for '"x" period of time
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Level of Noise (measured using a sound level meter)
L_{min}	Minimum Level of Noise (measured using a sound level meter)
Lp	Sound pressure level
LOS C	Level of Service C
Lw	Sound Power Level
OPR	California Governor's Office of Planning and Research
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root Mean Square

APPENDIX B

GLOSSARY

Term	Definition
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
CNEL	Community Noise Equivalent Level. CNEL is a weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
DNL, Ldn	Day Night Level. The DNL, or Ldn is a weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
L_{02}, L_{08}, L_{50}, L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
L_{max}, L_{min}	Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. Lmin is the minimum level.
Offensive/ Offending/Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

APPENDIX C

NOISE MEASUREMENT FIELD WORKSHEETS

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1, 2023

Project #: 19630

Noise Measurement #: STNM1 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 3050 Mission Inn Avenue, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: North entry/exit way to parking lot of multi-family residence 3050 Mission Inn Ave. Adjacent: Mission Inn Ave (running NW-SE) adjacent to north, Commerce St & rail lines (running NE-SW) ~230' northwest & 91 Freeway (running NE-SW) ~1,100' northwest, and multi-family residential to south.

Weather: Overcast. Sunset 7:56 PM **Settings:** SLOW FAST

Temperature: 65 deg F **Wind:** 8 mph **Humidity:** 61% **Terrain:** Flat

Start Time: 1:02 PM **End Time:** 1:17 PM **Run Time:**

Leq: 71.7 dB

Lmax 94.2 dB

L2 75.2 dB

L8 67.6 dB

L25 63.3 dB

L50 58.2 dB

Primary Noise Source: Traffic noise from the 56 vehicles passing microphone traveling on Mission Inn Avenue. Train horns from 2 passing freight trains 1:03PM & 1:16PM. Crossing bell.

Secondary Noise Sources: Traffic ambiance from 91 Fwy & vehicles on other roads. Overhead air traffic. Train activity on rail line. Stationary passenger train with engine idling.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

STNM1 looking SW down exit/entry way to parking lot of multi-family residence 3050 Mission Inn Ave, Riverside.

STNM1 looking E across Mission Inn Ave towards partially demolished building 2993 Mission Inn Ave, Riverside.

Summary	
File Name on Meter	LxT_Data.283.s
File Name on PC	LxT_0003099-20230601 130224-LxT_Data.283.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM1 33°58'45.05"N 117°21'57.46"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside

Measurement	
Start	2023-06-01 13:02:24
Stop	2023-06-01 13:17:24
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 13:01:57
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.8 dB

Results		
LAeq	71.7	
LAE	101.3	
EA	1.495	mPa²h
EA8	47.844	mPa²h
EA40	239.221	mPa²h
LApeak (max)	2023-06-01 13:17:19	106.9 dB
LASmax	2023-06-01 13:17:20	94.2 dB
LASmin	2023-06-01 13:09:04	52.9 dB

		Statistics	
LCeq	78.2 dB	**LA2.0**	75.2 dB
LAeq	71.7 dB	**LA8.0**	67.6 dB
LCeq - LAeq	6.5 dB	**LA25.**	63.3 dB
LAIeq	74.2 dB	**LA50.**	58.2 dB
LAeq	71.7 dB	**LA66.**	56.0 dB
LAIeq - LAeq	2.4 dB	**LA90.**	54.1 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.283.s	Computer's File Name	LxT_0003099-20230601 130224-LxT_Data.283.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM1 33°58'45.05"N 117°21'57.46"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 13:02:24	Duration	0:15:00.0
End Time	2023-06-01 13:17:24	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	71.7 dB		
LAE	101.3 dB	SEA	--- dB
EA	1.5 mPa²h	LAFTM5	77.8 dB
EA8	47.8 mPa²h		
EA40	239.2 mPa²h		
LA_{peak}	106.9 dB	2023-06-01 13:17:19	
LAS_{max}	94.2 dB	2023-06-01 13:17:20	
LAS_{min}	52.9 dB	2023-06-01 13:09:04	
LA_{eq}	71.7 dB		
LC_{eq}	78.2 dB	LC_{eq} - LA_{eq}	6.5 dB
LAI_{eq}	74.2 dB	LAI_{eq} - LA_{eq}	2.4 dB

Exceedances	Count	Duration
LAS > 65.0 dB	30	0:03:06.7
LAS > 85.0 dB	3	0:00:11.3
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

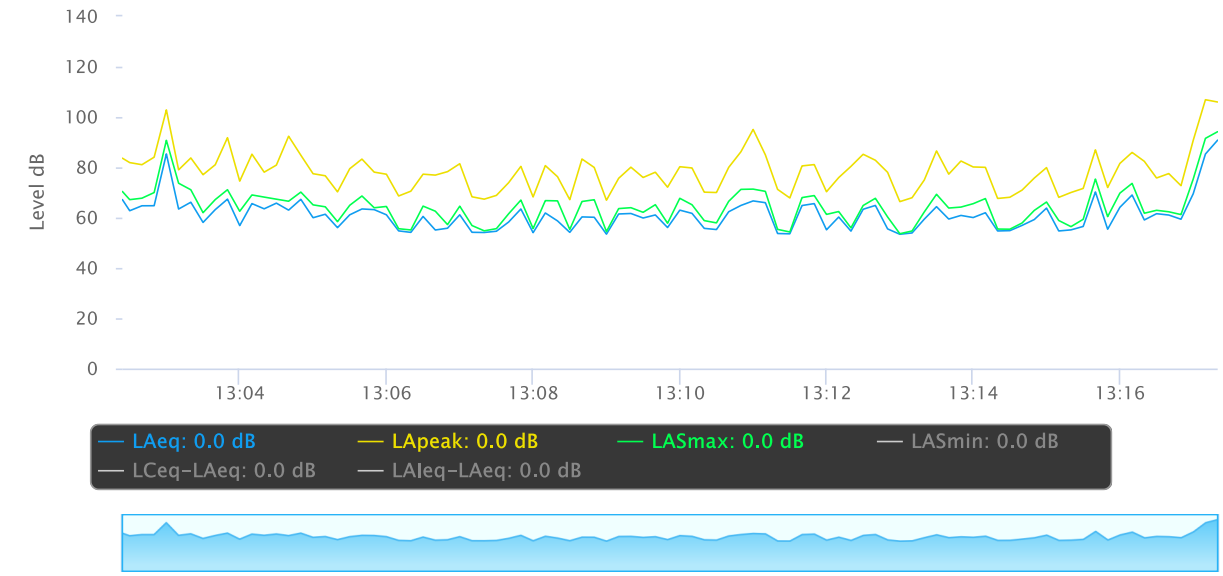
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	71.7 dB		78.2 dB		--- dB	
$L_{S(max)}$	94.2 dB	2023-06-01 13:17:20	--- dB		--- dB	
$L_{S(min)}$	52.9 dB	2023-06-01 13:09:04	--- dB		--- dB	
$L_{Peak(max)}$	106.9 dB	2023-06-01 13:17:19	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

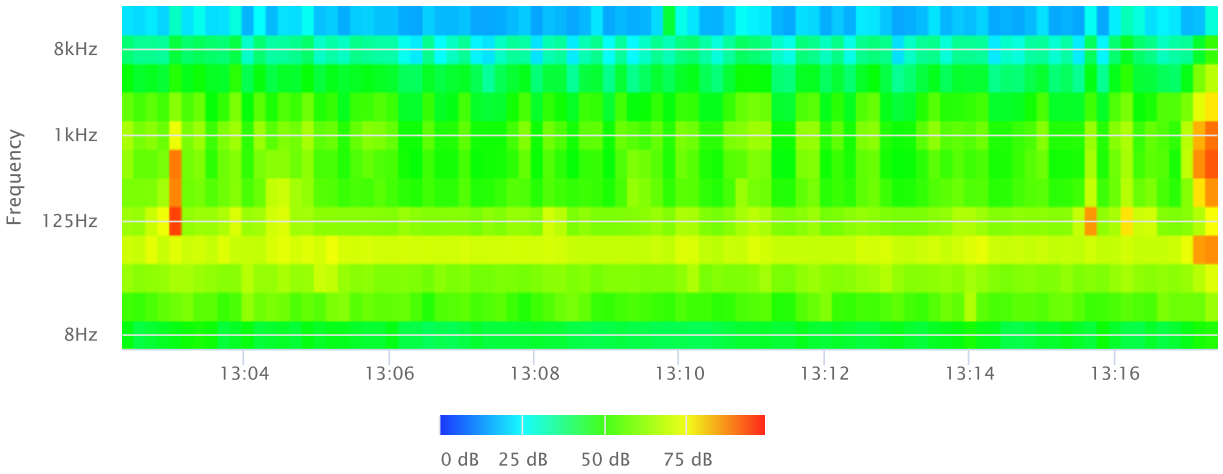
Statistics

LAS 2.0	75.2 dB
LAS 8.0	67.6 dB
LAS 25.0	63.3 dB
LAS 50.0	58.2 dB
LAS 66.6	56.0 dB
LAS 90.0	54.1 dB

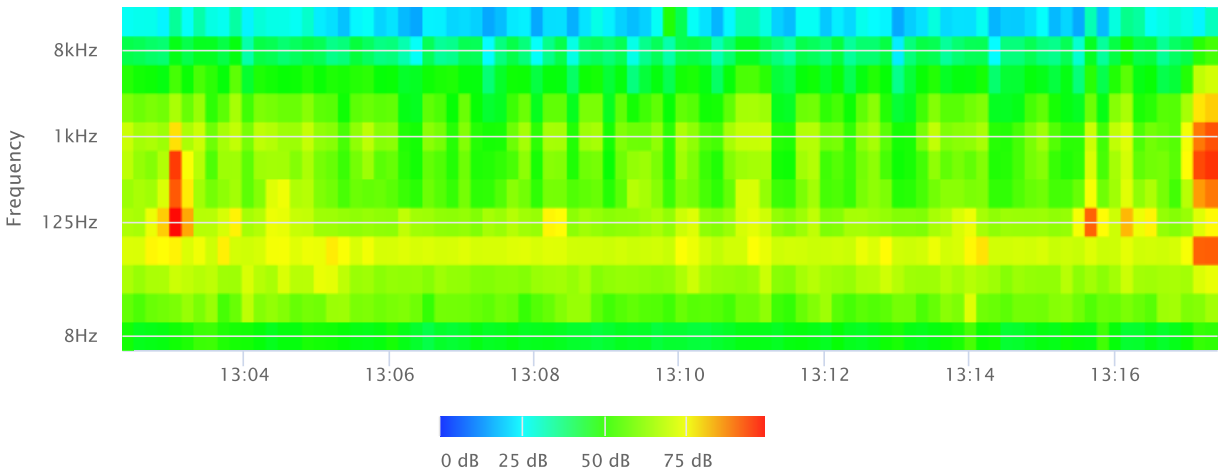
Time History



OBA 1/1 Leq



OBA 1/1 Lmax



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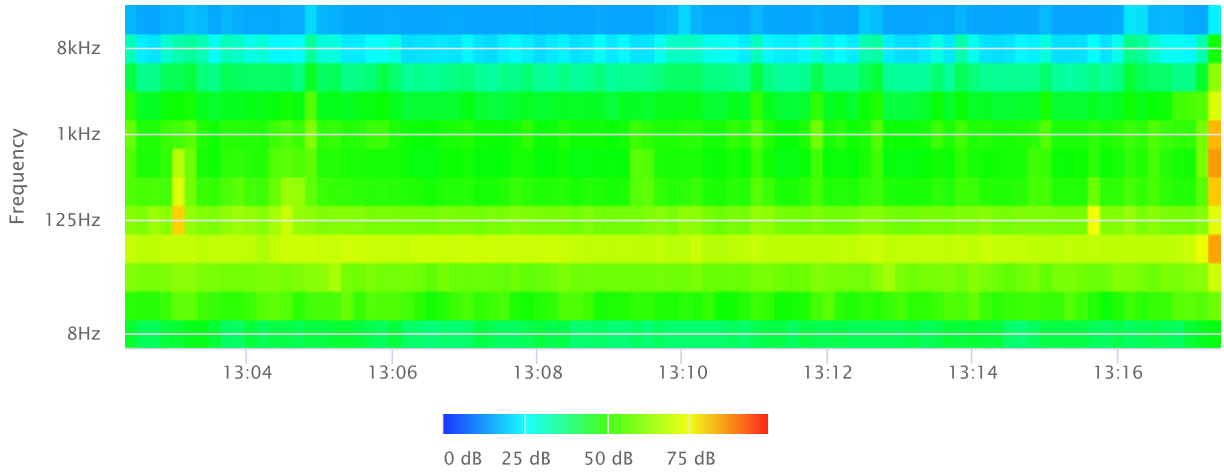
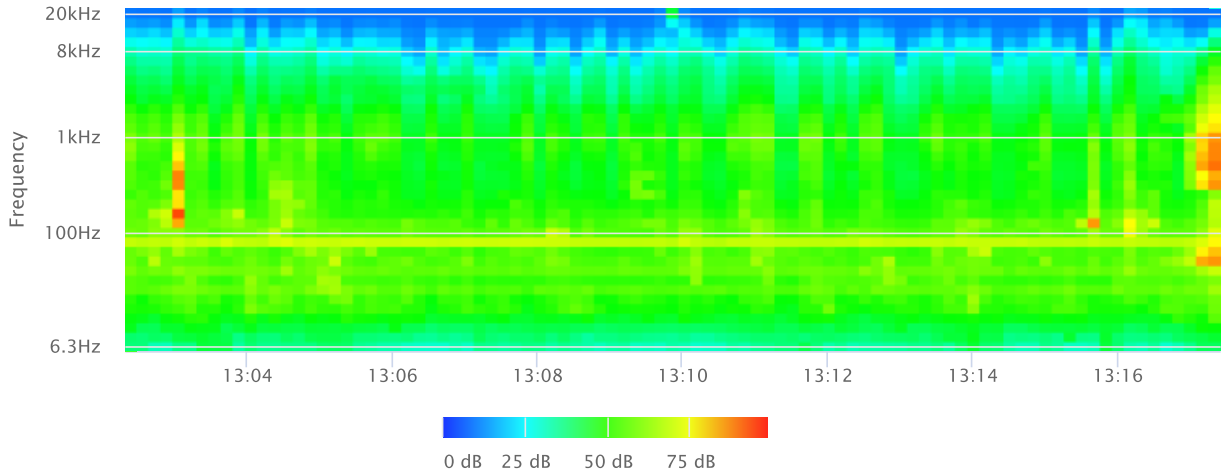
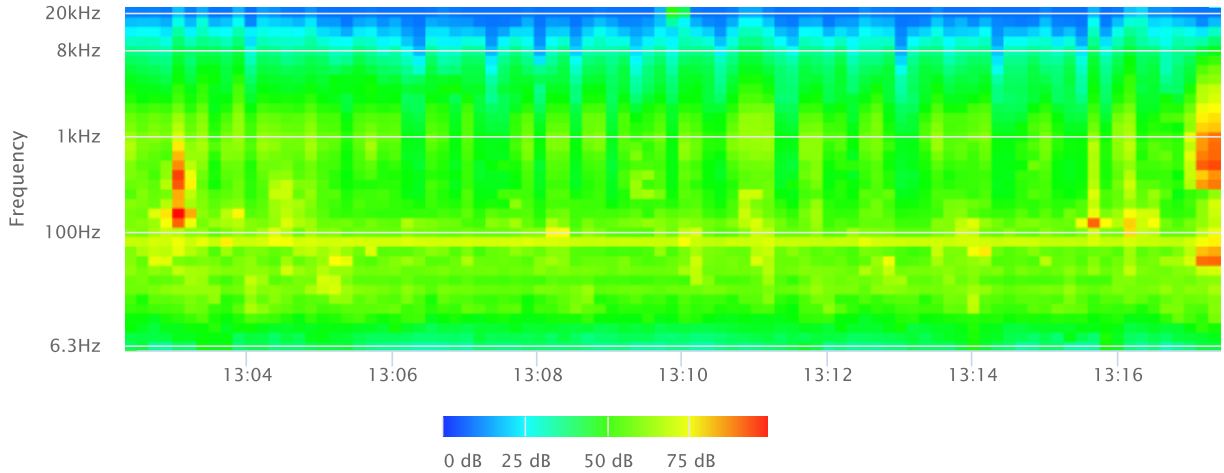


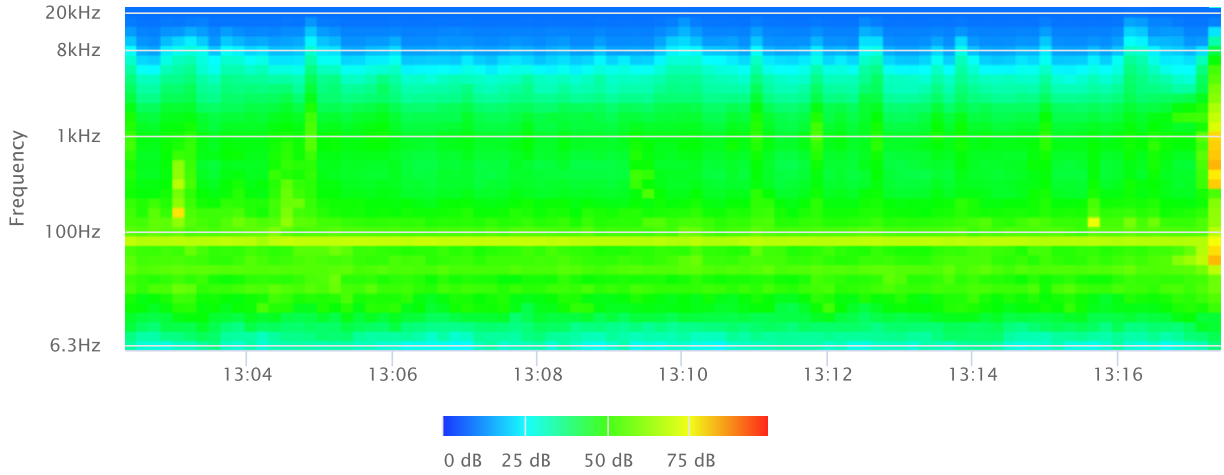
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
13:04
13:06
13:08
13:10
13:12
13:14
13:16
0 dB
25 dB
50 dB
75 dB

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1, 2023

Project #: 19630

Noise Measurement #: STNM2 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 2981 6th Street, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Just NW of 2980 6th St on the southern sidewalk to 6th Street. Adjacent: 6th St (running NW-SE) to north, Commerce St ~400' NW, rail lines ~570' NW & 91 Fwy ~1,205' NW of STNM2, single-family residential to southeast, and acant project site to southwest.

Weather: Overcast. Sunset 7:56 PM **Settings:** SLOW FAST

Temperature: 65 deg F **Wind:** 8 mph **Humidity:** 61% **Terrain:** Flat

Start Time: 1:44 PM **End Time:** 1:59 PM **Run Time:**

Leq: 62.4 dB

Lmax 82 dB

L2 71.6 dB

L8 61.7 dB

L25 58.9 dB

L50 56.9 dB

Primary Noise Source: Traffic noise from vehicles on 91 Fwy & other surrounding roads, no traffic on 6th St. Train horn from passing freight train 1:45PM. Distant crossing bell.

Secondary Noise Sources: Overhead air traffic. Leaf rustle from 8 mph breeze. Residential ambiance, children playing.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

STNM2 looking NE across 6th Street towards residence 2981 6th Street, Riverside.

STNM2 looking WNW down 6th Street towards Commerce Street intersection (~410'). Unoccupied building, 3596 Commerce Street, on right of image.

Summary	
File Name on Meter	LxT_Data.284.s
File Name on PC	LxT_0003099-20230601 134430-LxT_Data.284.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM2 33°58'47.65"N 117°21'52.56"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside

Measurement	
Start	2023-06-01 13:44:30
Stop	2023-06-01 13:59:30
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 13:44:07
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.7 dB

Results			
LA_{eq}	62.4		
LAE	92.0		
EA	175.309 µPa²h		
EA8	5.610 mPa²h		
EA40	28.049 mPa²h		
$LA_{peak\ (max)}$	2023-06-01 13:47:01	95.8 dB	
LAS_{max}	2023-06-01 13:47:03	82.0 dB	
LAS_{min}	2023-06-01 13:44:44	53.2 dB	

		Statistics	
LC_{eq}	74.5 dB	**LA2.00**	71.6 dB
LA_{eq}	62.4 dB	**LA8.00**	61.7 dB
LC_{eq} - LA_{eq}	12.0 dB	**LA25.00**	58.9 dB
LAI_{eq}	64.4 dB	**LA50.00**	56.9 dB
LA_{eq}	62.4 dB	**LA66.60**	56.3 dB
LAI_{eq} - LA_{eq}	2.0 dB	**LA90.00**	55.3 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.284.s	Computer's File Name	LxT_0003099-20230601 134430-LxT_Data.284.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM2 33°58'47.65"N 117°21'52.56"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 13:44:30	Duration	0:15:00.0
End Time	2023-06-01 13:59:30	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	62.4 dB		
LAE	92.0 dB	SEA	--- dB
EA	175.3 µPa²h	LAFTM5	66.9 dB
EA8	5.6 mPa²h		
EA40	28.0 mPa²h		
LA_{peak}	95.8 dB	2023-06-01 13:47:01	
LAS_{max}	82.0 dB	2023-06-01 13:47:03	
LAS_{min}	53.2 dB	2023-06-01 13:44:44	
LA_{eq}	62.4 dB		
LC_{eq}	74.5 dB	LC_{eq} - LA_{eq}	12.0 dB
LAI_{eq}	64.4 dB	LAI_{eq} - LA_{eq}	2.0 dB

Exceedances	Count	Duration
LAS > 65.0 dB	6	0:00:54.4
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

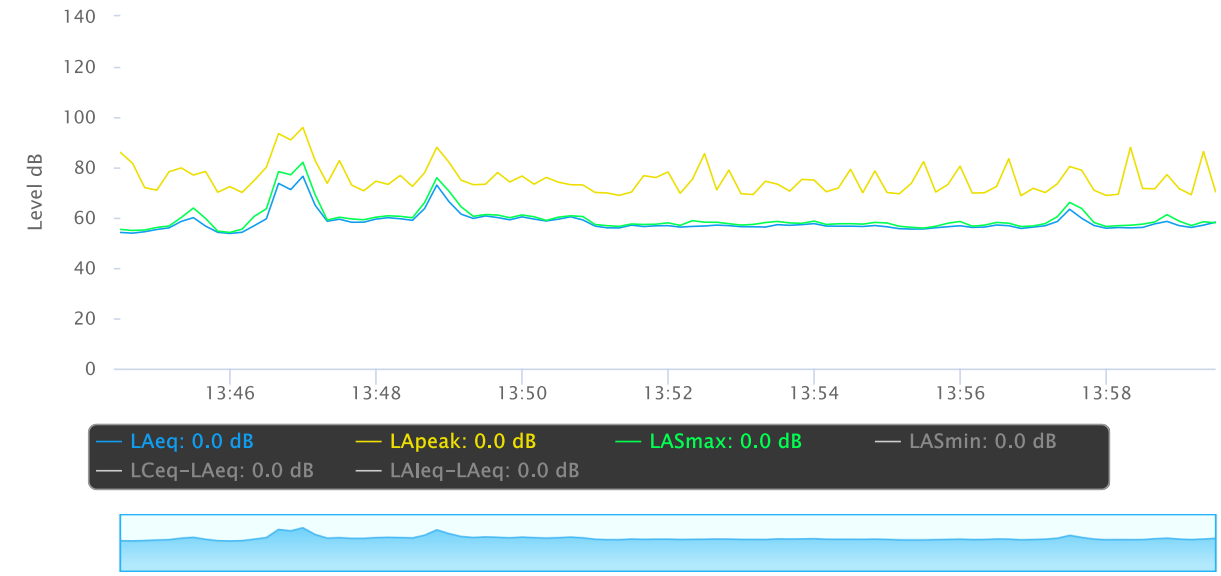
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	62.4 dB		74.5 dB		--- dB	
$L_{S(max)}$	82.0 dB	2023-06-01 13:47:03	--- dB		--- dB	
$L_{S(min)}$	53.2 dB	2023-06-01 13:44:44	--- dB		--- dB	
$L_{Peak(max)}$	95.8 dB	2023-06-01 13:47:01	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

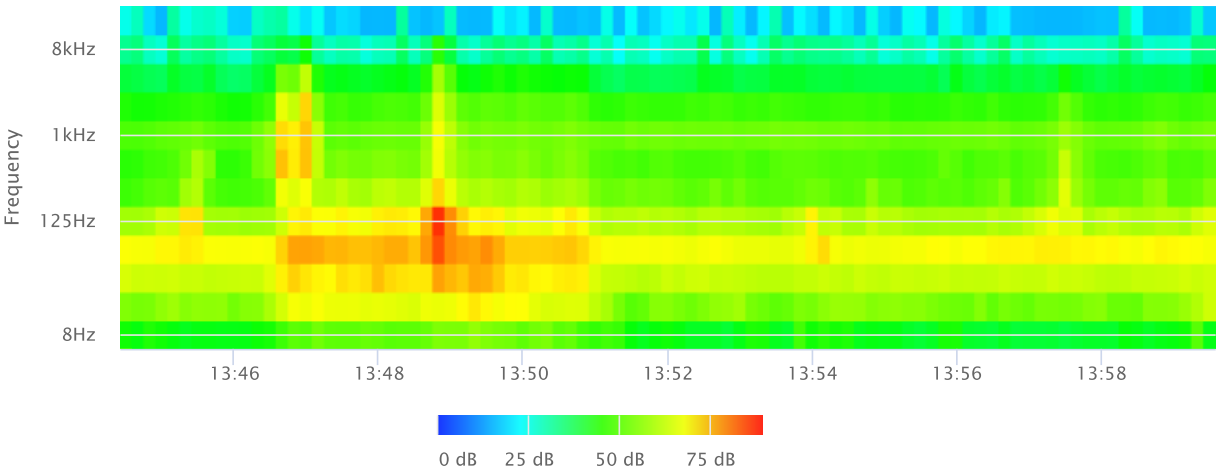
Statistics

LAS 2.0	71.6 dB
LAS 8.0	61.7 dB
LAS 25.0	58.9 dB
LAS 50.0	56.9 dB
LAS 66.6	56.3 dB
LAS 90.0	55.3 dB

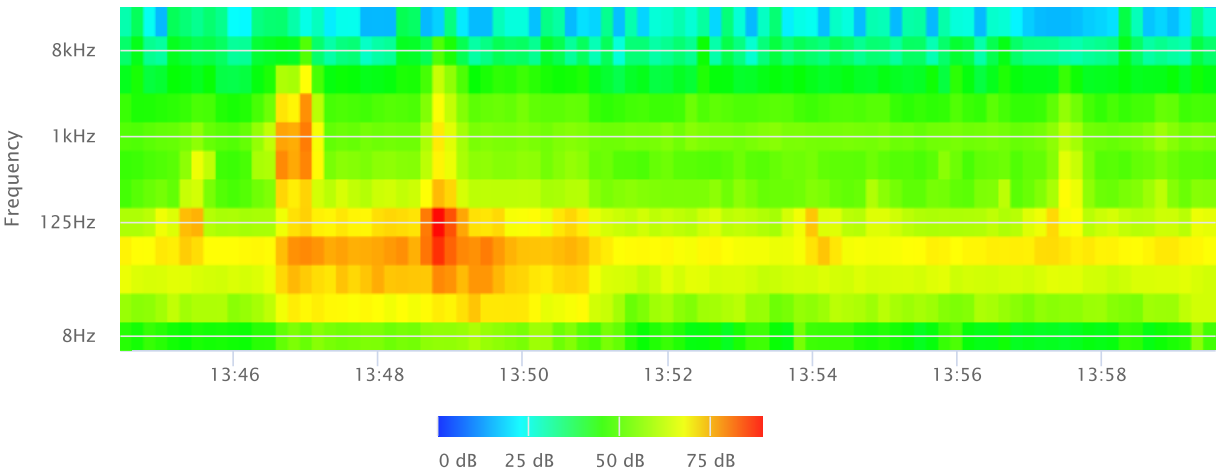
Time History



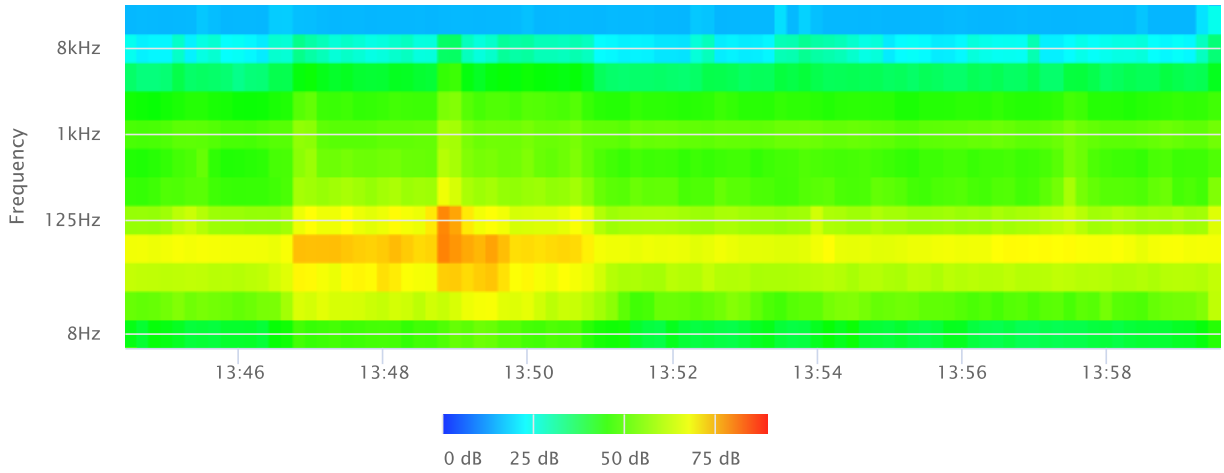
OBA 1/1 Leq



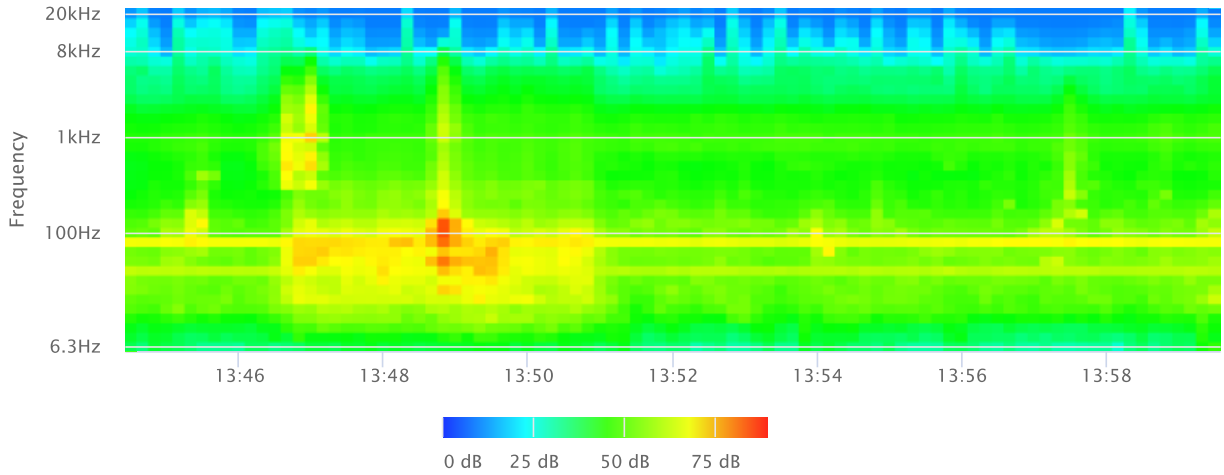
OBA 1/1 Lmax



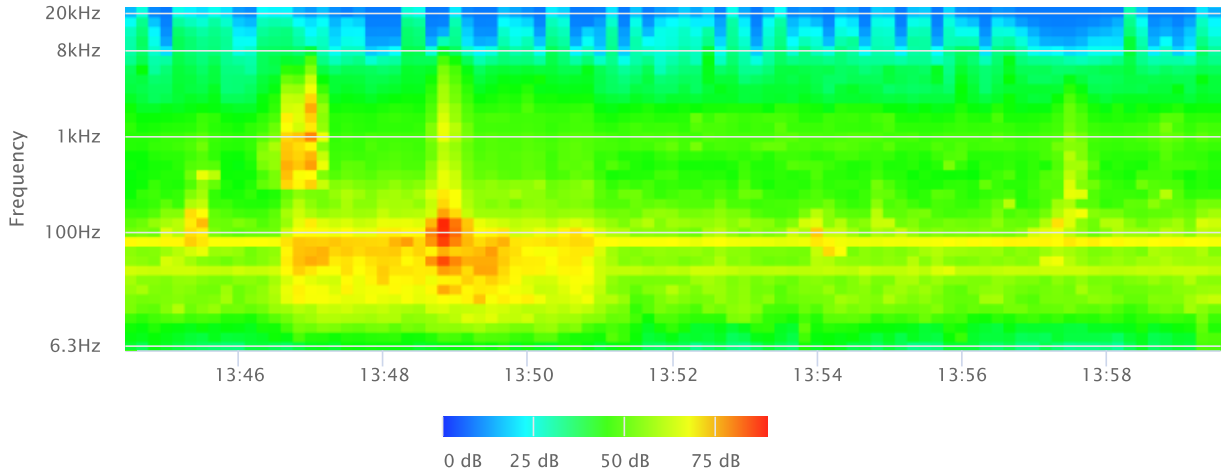
OBA 1/1 Lmin



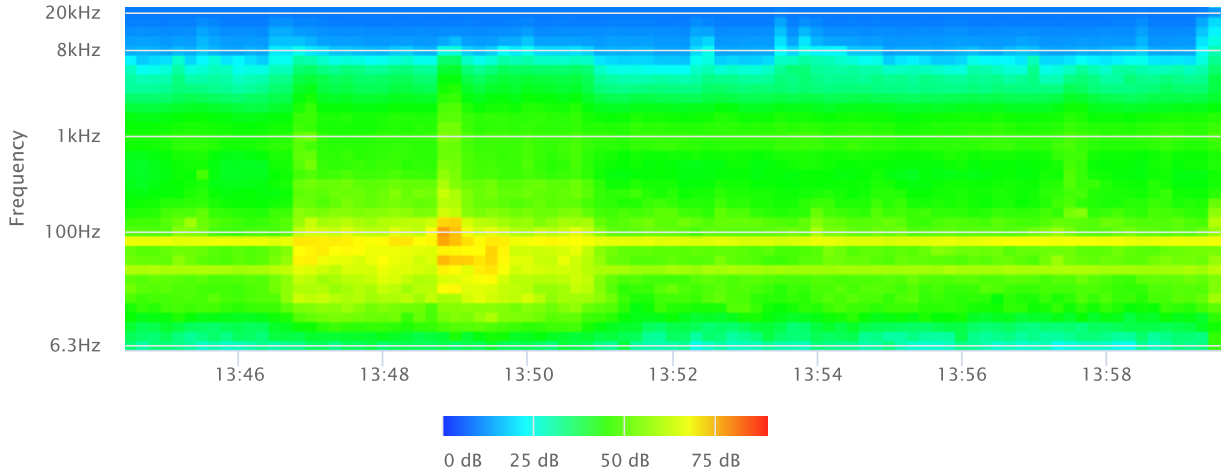
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
13:46
13:48
13:50
13:52
13:54
13:56
13:58
0 dB
25 dB
50 dB
75 dB

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1, 2023

Project #: 19630

Noise Measurement #: STNM3 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 2980 5th Street, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Just NW of residence 2980 5th St in southern sidewalk of 5th St. Adjacent: 5th St (running NW-SE) to north, Commerce St ~400' NW, rail lines~ 570' NW & 91 Fwy ~1,150' NW, single-family residentialto southeast, vacant project site to southwest, and single-famiy residential further north (across 5th St).

Weather: Overcast. Sunset 7:56 PM **Settings:** SLOW FAST

Temperature: 65 deg F **Wind:** 8 mph **Humidity:** 61% **Terrain:** Flat

Start Time: 2:22 PM **End Time:** 2:37 PM **Run Time:**

Leq: 56.7 dB

Lmax 63.4 dB

L2 59.7 dB

L8 58.1 dB

L25 57.1 dB

L50 56.4 dB

Primary Noise Source: Traffic noise from vehicles on 91 Fwy & other surrounding roads, no traffic on 5th St. Distant train horns but no passing trains at 5th St & Commerce St intersection.

Secondary Noise Sources: Traffic ambiance from 91 Fwy & vehicles on other roads. Overhead air traffic. Leaf rustle from 8 mph breeze. Residential ambiance, children playing. Roosters.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

STNM3 looking NE across 5th Street towards residence 2981 5th Street, Riverside.

STNM3 looking WNW down 5th Street towards Commerce Street intersection (~410').

Summary	
File Name on Meter	LxT_Data.285.s
File Name on PC	LxT_0003099-20230601 142204-LxT_Data.285.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM3 33°58'51.16"N 117°21'50.28"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.

Measurement	
Start	2023-06-01 14:22:04
Stop	2023-06-01 14:37:04
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 14:21:44
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.8 dB

Results			
LA_{eq}	56.7		
LAE	86.3		
EA	46.945 µPa²h		
EA8	1.502 mPa²h		
EA40	7.511 mPa²h		
$LA_{peak\ (max)}$	2023-06-01 14:35:40	88.4 dB	
LAS_{max}	2023-06-01 14:23:29	63.4 dB	
LAS_{min}	2023-06-01 14:29:07	54.2 dB	

		Statistics	
LC_{eq}	66.0 dB	**LA2.00**	59.7 dB
LA_{eq}	56.7 dB	**LA8.00**	58.1 dB
LC_{eq} - LA_{eq}	9.3 dB	**LA25.00**	57.1 dB
LAI_{eq}	57.8 dB	**LA50.00**	56.4 dB
LA_{eq}	56.7 dB	**LA66.60**	56.1 dB
LAI_{eq} - LA_{eq}	1.1 dB	**LA90.00**	55.3 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.285.s	Computer's File Name	LxT_0003099-20230601 142204-LxT_Data.285.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM3 33°58'51.16"N 117°21'50.28"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 14:22:04	Duration	0:15:00.0
End Time	2023-06-01 14:37:04	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	56.7 dB		
LAE	86.3 dB	SEA	--- dB
EA	46.9 µPa²h	LAFTM5	59.2 dB
EA8	1.5 mPa²h		
EA40	7.5 mPa²h		
LA_{peak}	88.4 dB	2023-06-01 14:35:40	
LAS_{max}	63.4 dB	2023-06-01 14:23:29	
LAS_{min}	54.2 dB	2023-06-01 14:29:07	
LA_{eq}	56.7 dB		
LC_{eq}	66.0 dB	LC_{eq} - LA_{eq}	9.3 dB
LAI_{eq}	57.8 dB	LAI_{eq} - LA_{eq}	1.1 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	56.7 dB		66.0 dB		--- dB	
$L_{S(max)}$	63.4 dB	2023-06-01 14:23:29	--- dB		--- dB	
$L_{S(min)}$	54.2 dB	2023-06-01 14:29:07	--- dB		--- dB	
$L_{Peak(max)}$	88.4 dB	2023-06-01 14:35:40	--- dB		--- dB	

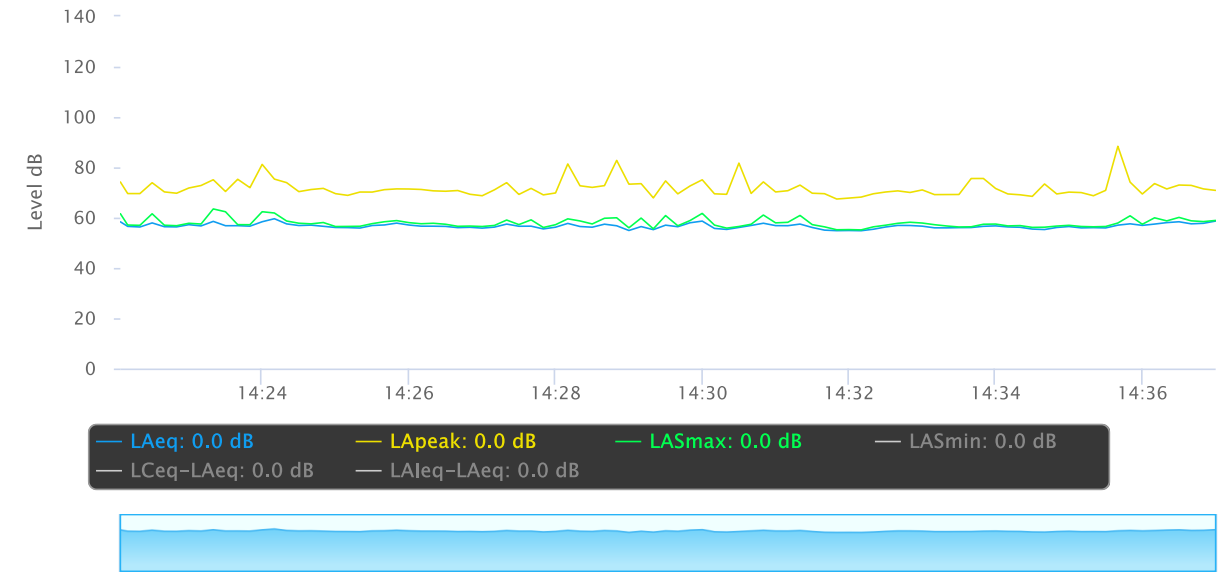
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

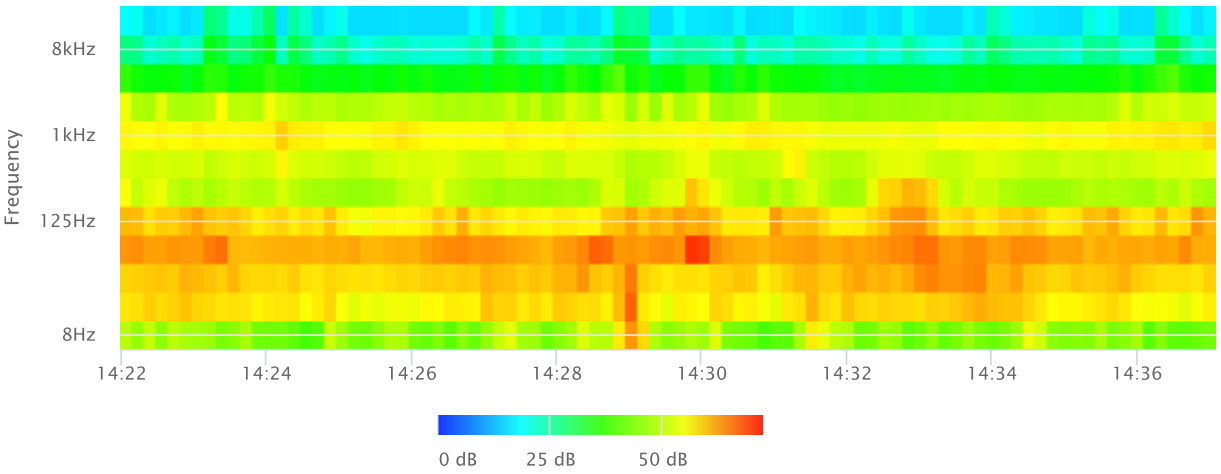
Statistics

LAS 2.0	59.7 dB
LAS 8.0	58.1 dB
LAS 25.0	57.1 dB
LAS 50.0	56.4 dB
LAS 66.6	56.1 dB
LAS 90.0	55.3 dB

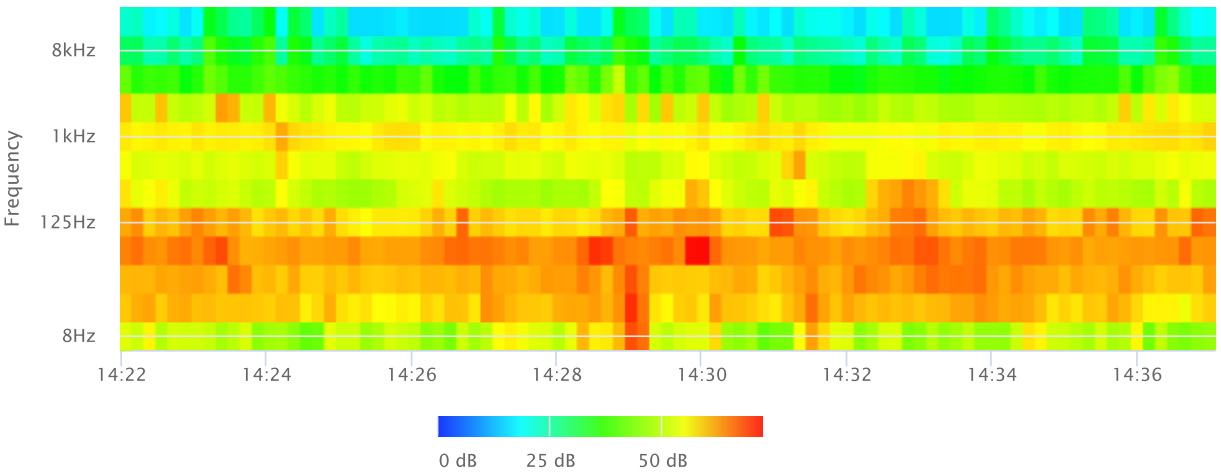
Time History



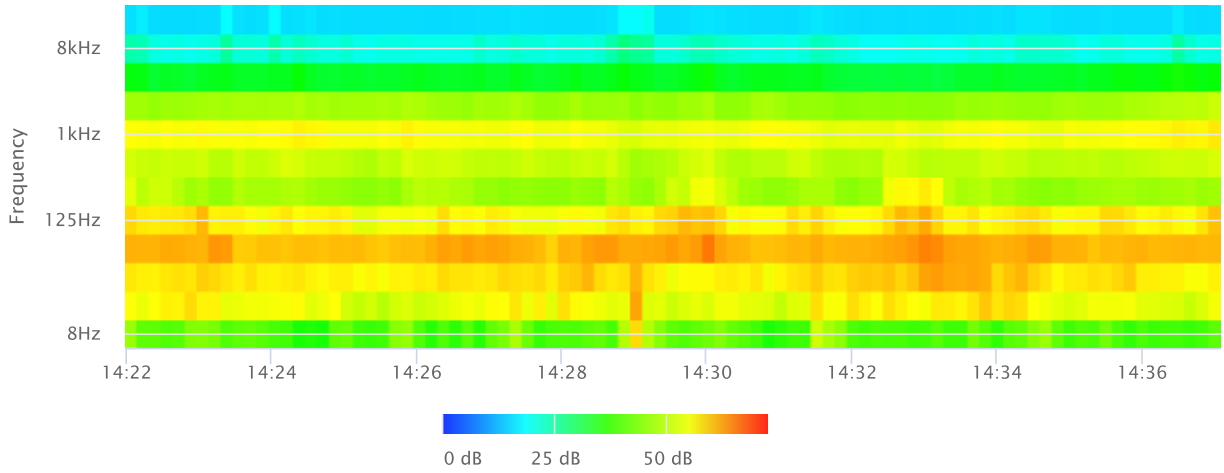
OBA 1/1 Leq



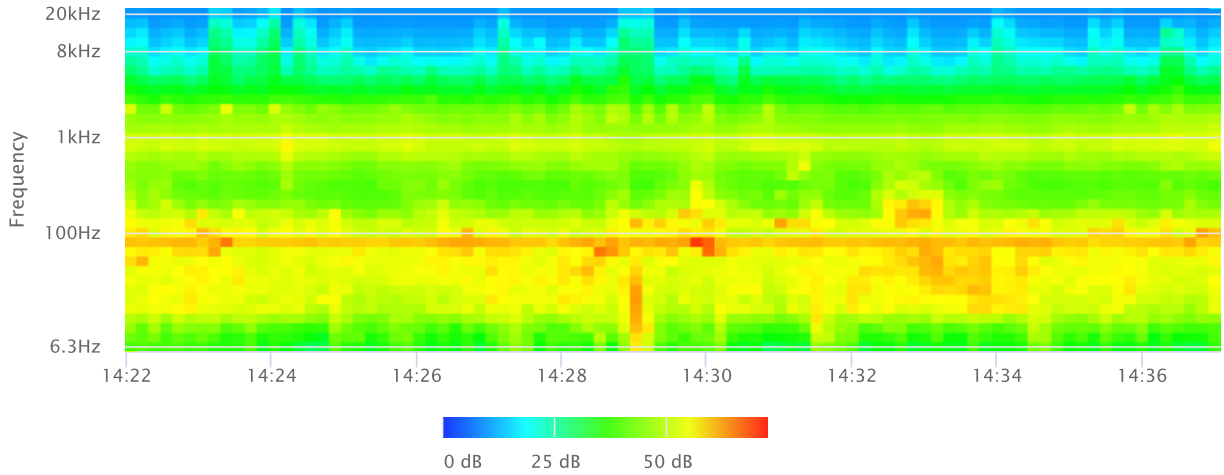
OBA 1/1 Lmax



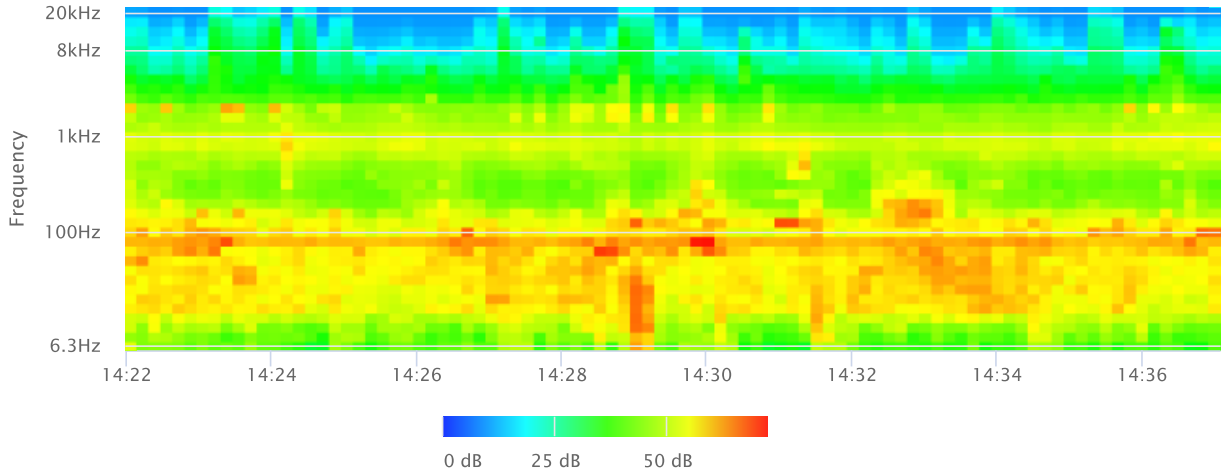
OBA 1/1 Lmin



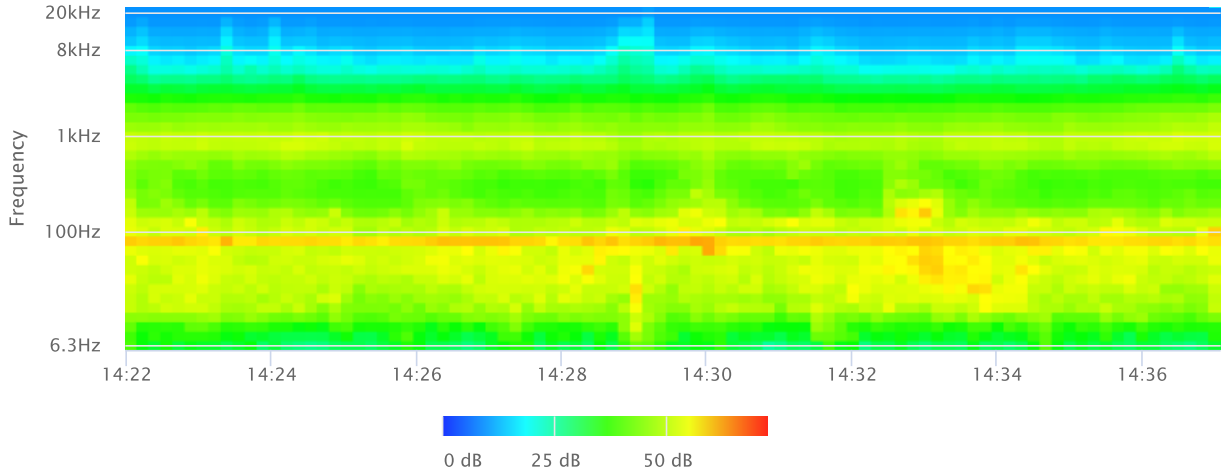
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
14:22
14:24
14:26
14:28
14:30
14:32
14:34
14:36
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1, 2023

Project #: 19630

Noise Measurement #: STNM4 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 3008 4th Street, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Near NW corner of residence 3008 4th St on southern sidewalk of 4th St. Adjacent: 4th St (running NW-SE) adjacen to north, Commerce St ~300' NW, rail lines ~460' NW, 91 Fwy ~950' NW, single-family resident to southeast, vacant project site to southwest, and commercial uses to north (across 4th St).

Weather: Overcast. Sunset 7:56 PM **Settings:** SLOW FAST

Temperature: 65 deg F **Wind:** 8 mph **Humidity:** 61% **Terrain:** Flat

Start Time: 2:54 PM **End Time:** 3:09 PM **Run Time:**

Leq: 58.8 dB

Lmax 64.5 dB

L2 61.3 dB

L8 60.1 dB

L25 59.1 dB

L50 58.5 dB

Primary Noise Source: Traffic noise from vehicles on 91 Fwy & other surrounding roads, no traffic on 4th St. Distant train horns but no passing trains on 4th St & Commerce St intersection.

Secondary Noise Sources: Overhead air traffic. Leaf rustle from 8 mph breeze. Residential ambiance, children playing, distant dogs barking.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

STNM4 looking NE across 4th Street towards building 2622 3rd Street, Riverside.

STNM4 looking S towards closest residence 3008 4th Street, Riverside.

Summary	
File Name on Meter	LxT_Data.286.s
File Name on PC	LxT_0003099-20230601 145411-LxT_Data.286.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM4 33°58'55.12"N 117°21'49.13"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.

Measurement	
Start	2023-06-01 14:54:11
Stop	2023-06-01 15:09:11
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 14:53:48
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.7 dB

Results			
LAeq	58.8		
LAE	88.3		
EA	75.068	µPa²h	
EA8	2.402	mPa²h	
EA40	12.011	mPa²h	
LApeak (max)	2023-06-01 14:55:50	91.7	dB
LASmax	2023-06-01 15:04:20	64.5	dB
LASmin	2023-06-01 15:06:42	56.6	dB

			Statistics	
LCeq	66.7	dB	**LA2.00**	61.3 dB
LAeq	58.8	dB	**LA8.00**	60.1 dB
LCeq - LAeq	8.0	dB	**LA25.00**	59.1 dB
LAleq	60.2	dB	**LA50.00**	58.5 dB
LAeq	58.8	dB	**LA66.60**	58.1 dB
LAleq - LAeq	1.5	dB	**LA90.00**	57.5 dB
Overload Count	0			

Measurement Report

Report Summary

Meter's File Name	LxT_Data.286.s	Computer's File Name	LxT_0003099-20230601 145411-LxT_Data.286.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM4 33°58'55.12"N 117°21'49.13"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 14:54:11	Duration	0:15:00.0
End Time	2023-06-01 15:09:11	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	58.8 dB		
LAE	88.3 dB	SEA	--- dB
EA	75.1 µPa²h	LAFTM5	61.2 dB
EA8	2.4 mPa²h		
EA40	12.0 mPa²h		
LA_{peak}	91.7 dB	2023-06-01 14:55:50	
LAS_{max}	64.5 dB	2023-06-01 15:04:20	
LAS_{min}	56.6 dB	2023-06-01 15:06:42	
LA_{eq}	58.8 dB		
LC_{eq}	66.7 dB	LC_{eq} - LA_{eq}	8.0 dB
LAI_{eq}	60.2 dB	LAI_{eq} - LA_{eq}	1.5 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	58.8 dB		66.7 dB		--- dB	
$L_{S(max)}$	64.5 dB	2023-06-01 15:04:20	--- dB		--- dB	
$L_{S(min)}$	56.6 dB	2023-06-01 15:06:42	--- dB		--- dB	
$L_{Peak(max)}$	91.7 dB	2023-06-01 14:55:50	--- dB		--- dB	

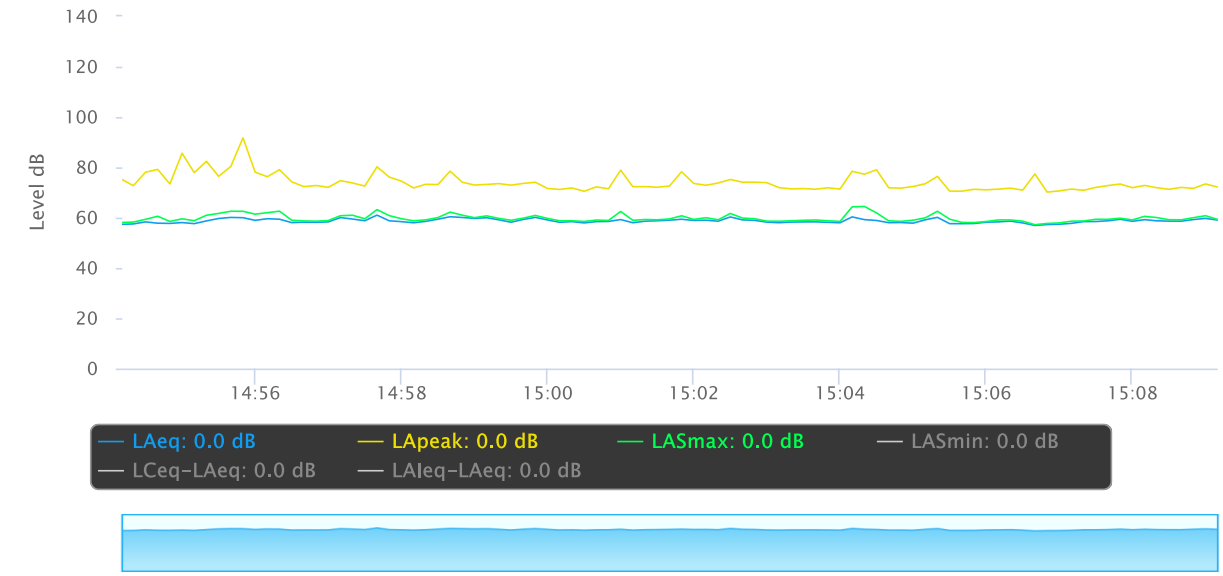
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

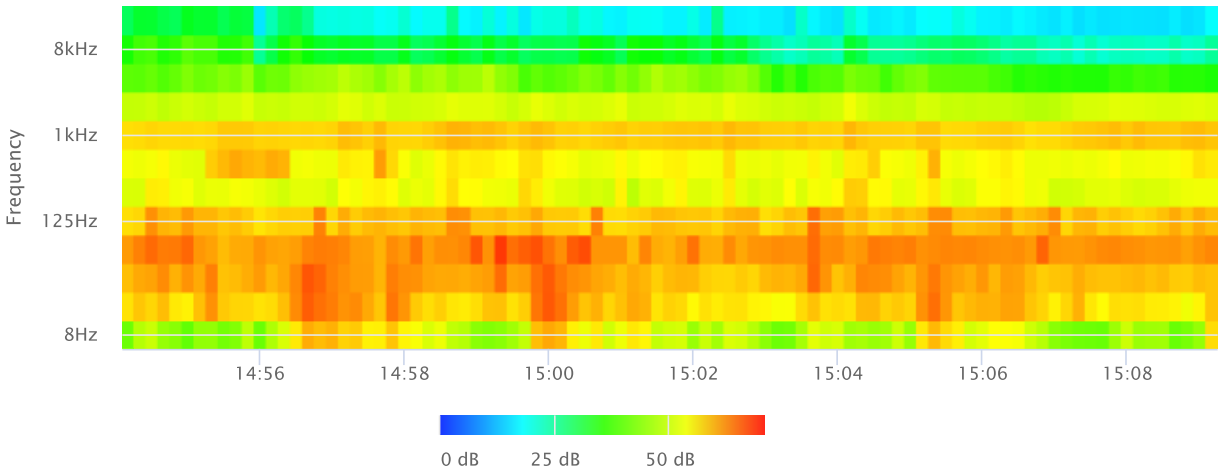
Statistics

LAS 2.0	61.3 dB
LAS 8.0	60.1 dB
LAS 25.0	59.1 dB
LAS 50.0	58.5 dB
LAS 66.6	58.1 dB
LAS 90.0	57.5 dB

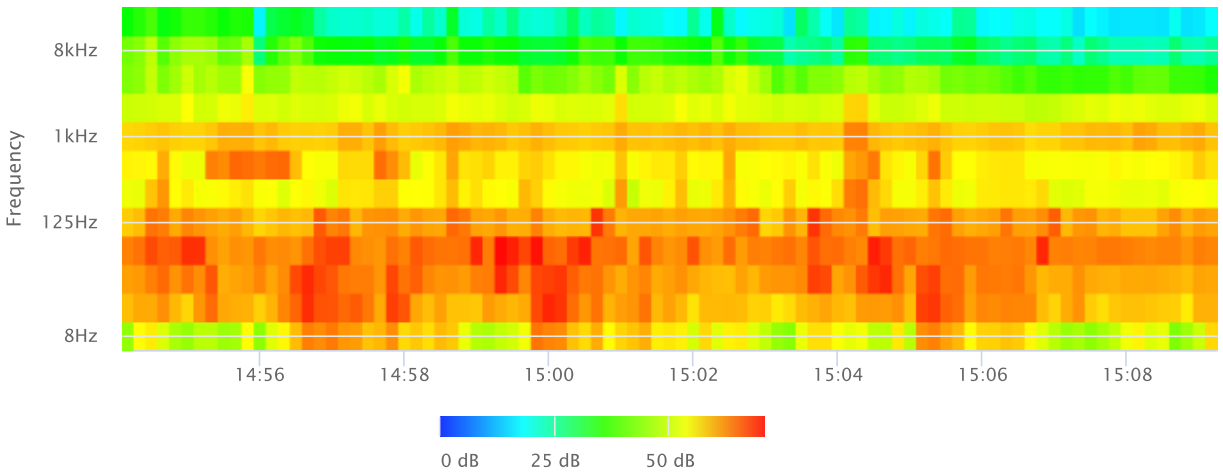
Time History



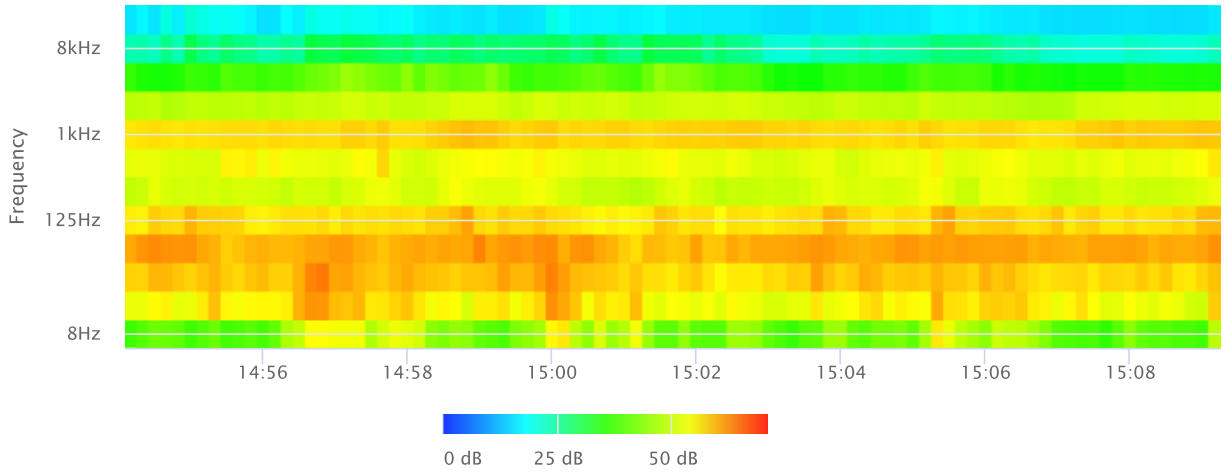
OBA 1/1 Leq



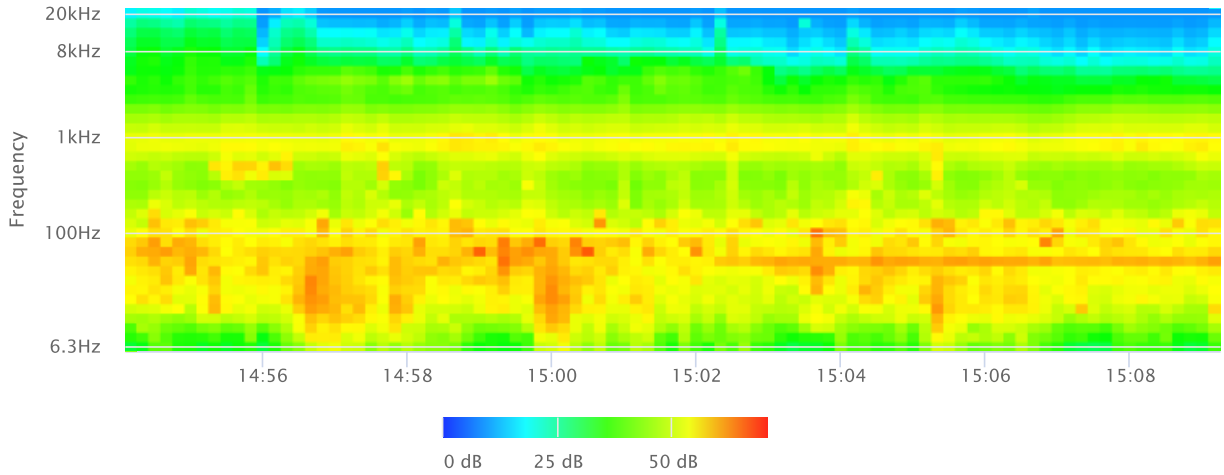
OBA 1/1 Lmax



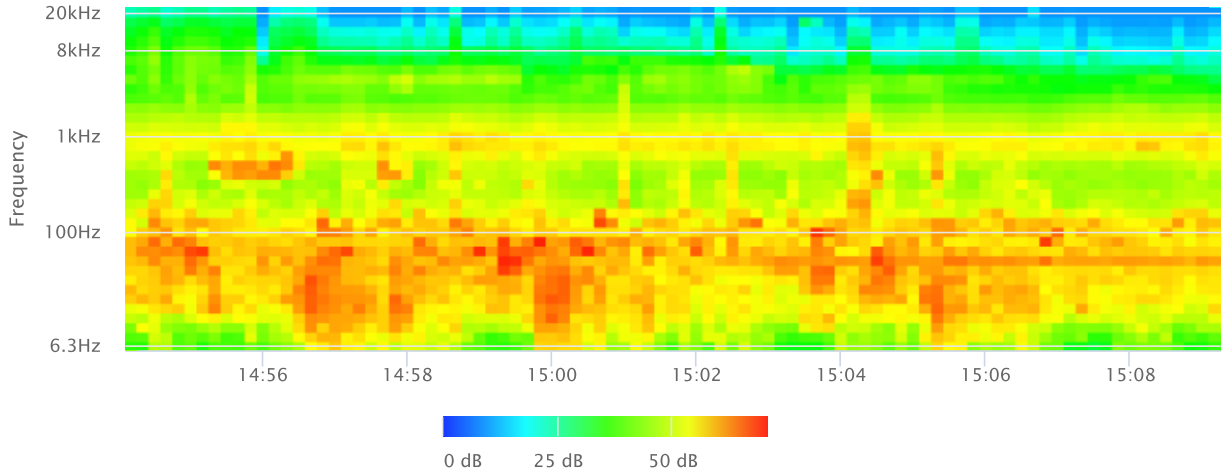
OBA 1/1 Lmin



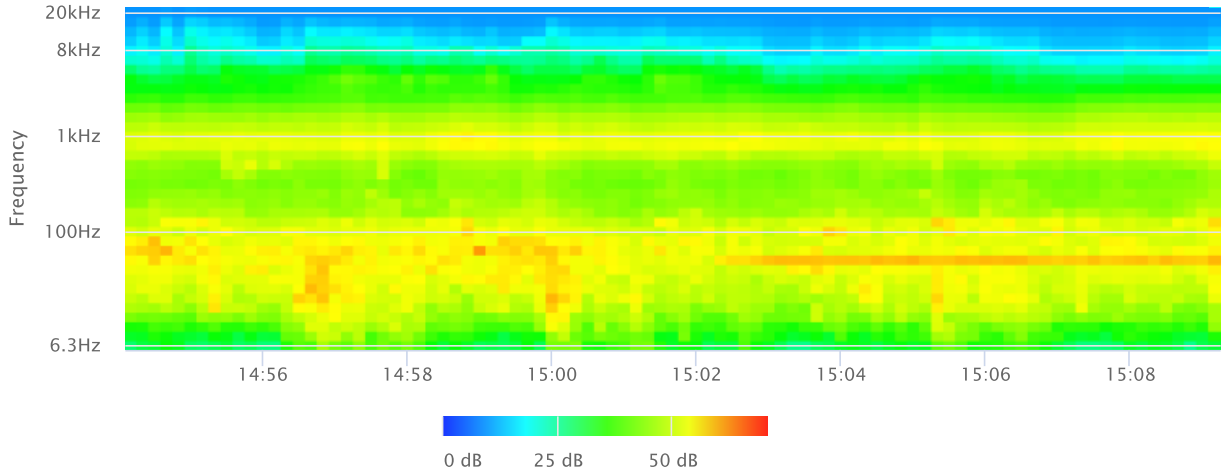
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
14:56
14:58
15:00
15:02
15:04
15:06
15:08
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1, 2023

Project #: 19630

Noise Measurement #: STNM5 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: Commerce Street & 6th Street, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: ~60' SW of Commerce St & 6th St intersection on eastern side of Commerce St. Adjacent:.Commerce St just NW, rail lines ~160' NW, 91 Fwy ~870' NW, 6th St ~70' NE, and vacant project site to east.

Weather: Overcast. Sunset 7:56 PM **Settings:** SLOW FAST

Temperature: 65 deg F **Wind:** 8 mph **Humidity:** 61% **Terrain:** Flat

Start Time: 3:28 PM **End Time:** 3:43 PM **Run Time:**

Leq: 64.6 dB

Lmax 87.8 dB

L2 71.8 dB

L8 65.4 dB

L25 61.0 dB

L50 59.3 dB

Primary Noise Source: Traffic noise from vehicles on 91 Fwy & other surrounding roads, 21 vehicles passed STNM5 on Commerce St. Passenger train passes microphone at 3:37 PM, train horn.

Secondary Noise Sources: Overhead air traffic. Leaf rustle from 8 mph breeze. Train crossing bell on Mission Inn Avenue.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

STNM5 looking NE down Commerce Street towards 6th Street intersection (~70'). Unoccupied building 3596 Commerce Street.

STNM5 looking SW down Commerce Street towards Mission Inn Avenue intersection (~300'). Building 3093 Mission Inn Avenue on the left.

Summary	
File Name on Meter	LxT_Data.287.s
File Name on PC	LxT_0003099-20230601 152811-LxT_Data.287.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM5 33°58'49.10"N 117°21'57.06"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside

Measurement	
Start	2023-06-01 15:28:11
Stop	2023-06-01 15:43:11
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 15:27:41
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.7 dB

Results			
LA_{eq}	64.6		
LAE	94.1		
EA	286.883	µPa²h	
EA8	9.180	mPa²h	
EA40	45.901	mPa²h	
$LA_{peak\ (max)}$	2023-06-01 15:36:55	104.0	dB
LAS_{max}	2023-06-01 15:36:55	87.8	dB
LAS_{min}	2023-06-01 15:42:47	54.9	dB

			Statistics	
LC_{eq}	71.4	dB	**LA2.00**	71.8 dB
LA_{eq}	64.6	dB	**LA8.00**	65.4 dB
LC_{eq} - LA_{eq}	6.8	dB	**LA25.00**	61.0 dB
LAI_{eq}	68.7	dB	**LA50.00**	59.3 dB
LA_{eq}	64.6	dB	**LA66.60**	58.4 dB
LAI_{eq} - LA_{eq}	4.1	dB	**LA90.00**	57.2 dB
Overload Count	0			

Measurement Report

Report Summary

Meter's File Name	LxT_Data.287.s	Computer's File Name	LxT_0003099-20230601 152811-LxT_Data.287.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM5 33°58'49.10"N 117°21'57.06"W
Job Description	15 minute noise measurement (1 x 15 minutes)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 15:28:11	Duration	0:15:00.0
End Time	2023-06-01 15:43:11	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	64.6 dB		
LAE	94.1 dB	SEA	--- dB
EA	286.9 µPa²h	LAFTM5	72.0 dB
EA8	9.2 mPa²h		
EA40	45.9 mPa²h		
LA_{peak}	104.0 dB	2023-06-01 15:36:55	
LAS_{max}	87.8 dB	2023-06-01 15:36:55	
LAS_{min}	54.9 dB	2023-06-01 15:42:47	
LA_{eq}	64.6 dB		
LC_{eq}	71.4 dB	LC_{eq} - LA_{eq}	6.8 dB
LAI_{eq}	68.7 dB	LAI_{eq} - LA_{eq}	4.1 dB

Exceedances	Count	Duration
LAS > 65.0 dB	19	0:01:49.8
LAS > 85.0 dB	1	0:00:01.6
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

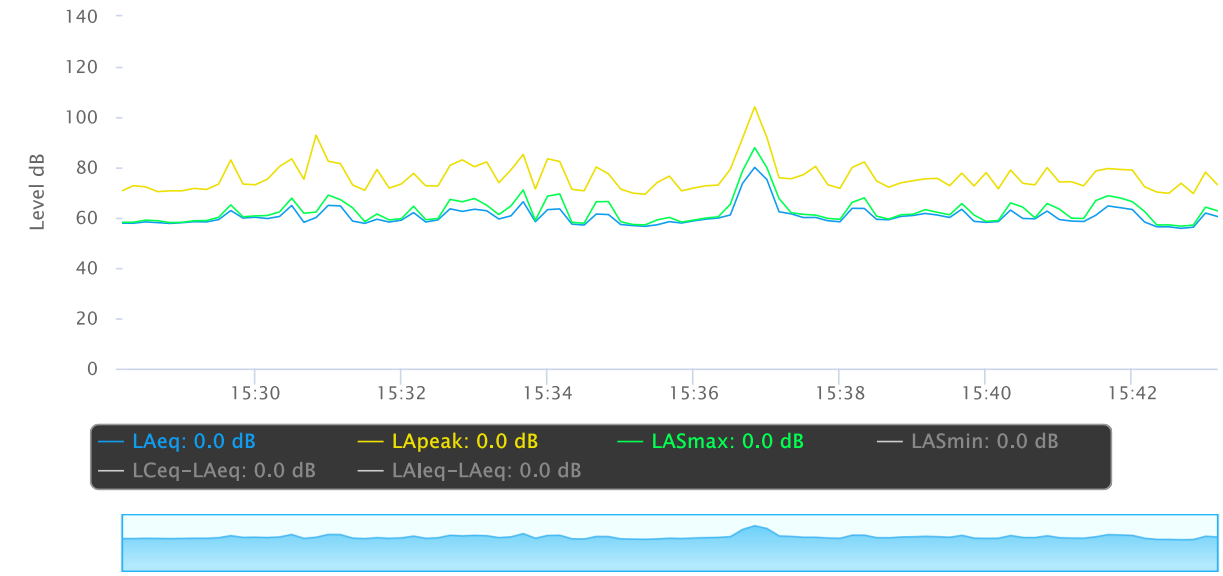
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	64.6 dB		71.4 dB		--- dB	
$L_{S(max)}$	87.8 dB	2023-06-01 15:36:55	--- dB		--- dB	
$L_{S(min)}$	54.9 dB	2023-06-01 15:42:47	--- dB		--- dB	
$L_{Peak(max)}$	104.0 dB	2023-06-01 15:36:55	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

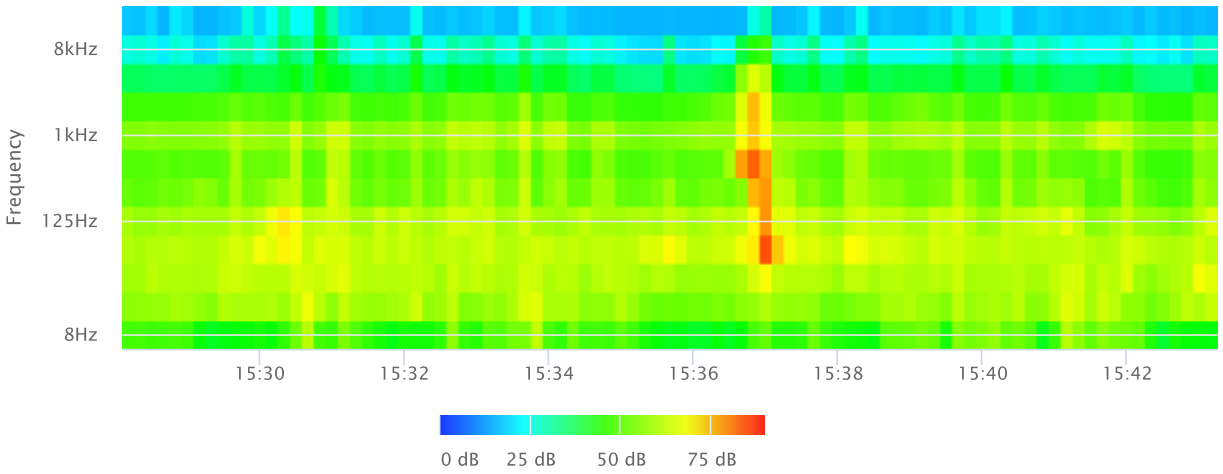
Statistics

LAS 2.0	71.8 dB
LAS 8.0	65.4 dB
LAS 25.0	61.0 dB
LAS 50.0	59.3 dB
LAS 66.6	58.4 dB
LAS 90.0	57.2 dB

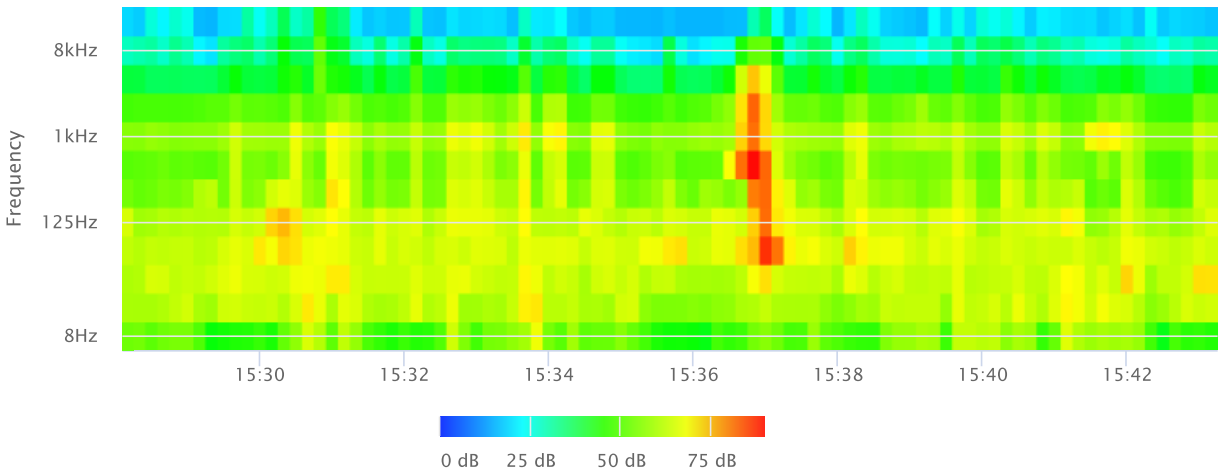
Time History



OBA 1/1 Leq



OBA 1/1 Lmax



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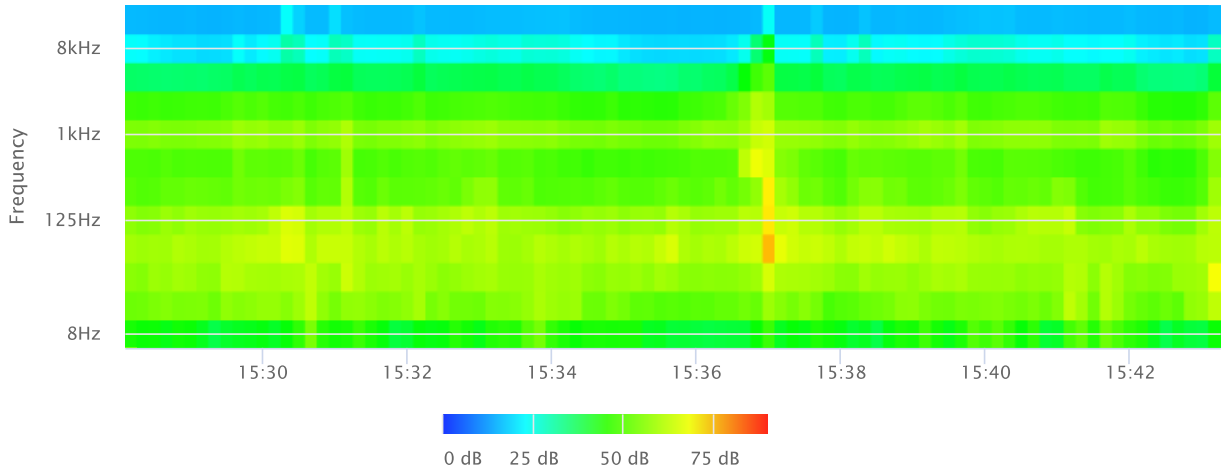

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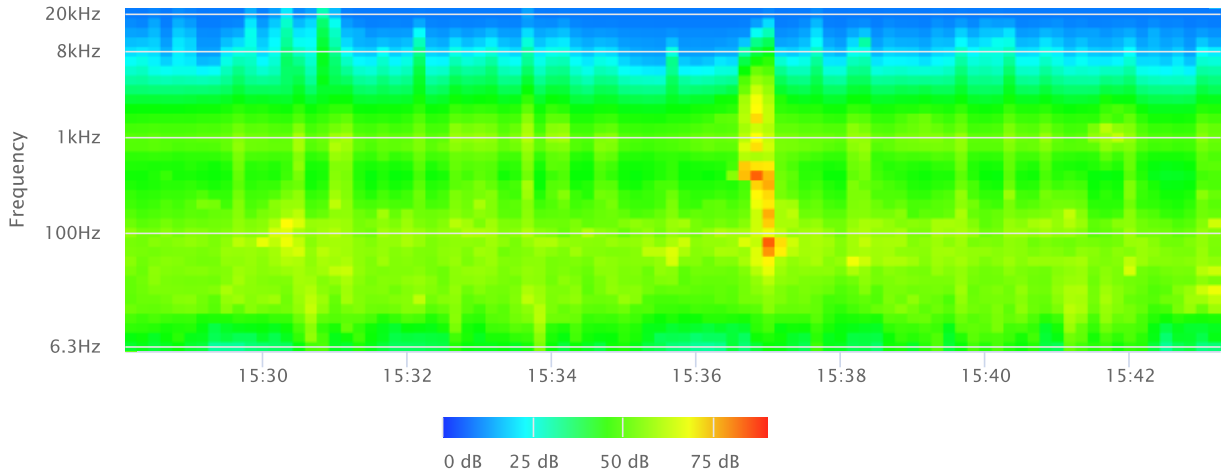
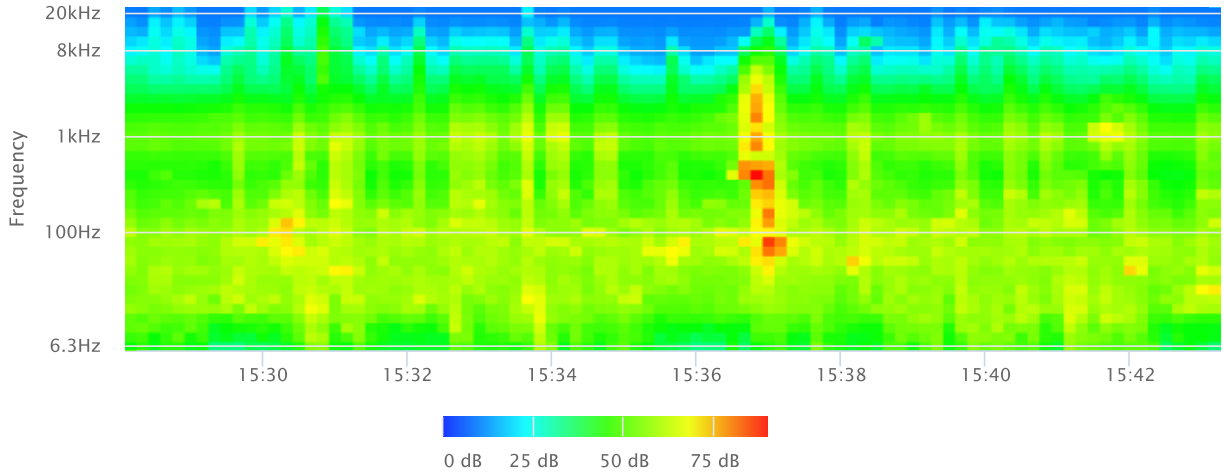


OBA 1/3 Lmax



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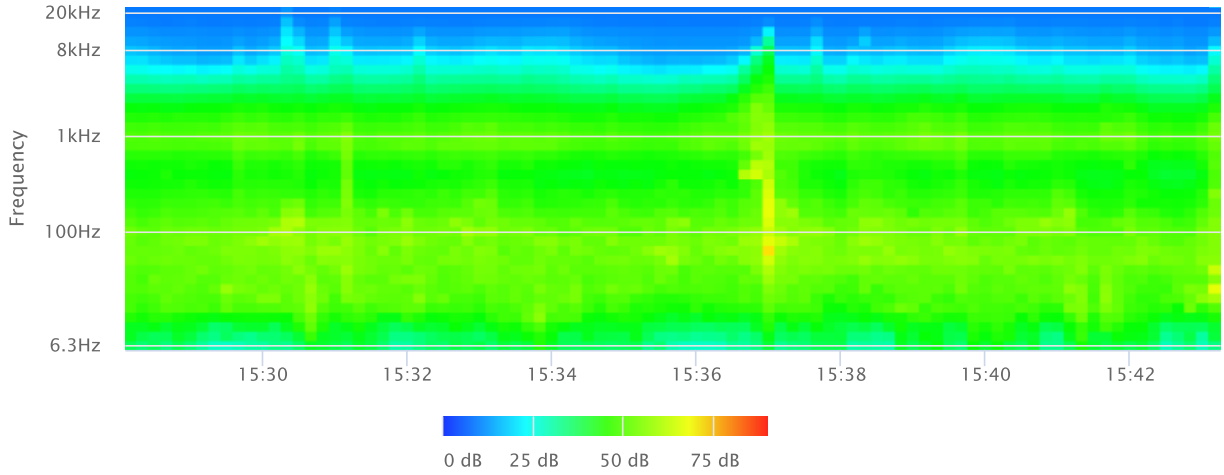

20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
15:30
15:32
15:34
15:36
15:38
15:40
15:42
0 dB
25 dB
50 dB
75 dB

Noise Measurement
Field Data

Project Name: Iron Lofts Multifamily Residential, City of Riverside **Date:** June 1-2, 2023

Project #: 19630

Noise Measurement #: LTNM1 Run Time: 24 hours (24 x 1 hours) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 3596 Commerce Street, Riverside, CA 92507

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: ~90' SE of Commerce St & 6th St intersection just south of 6th St. Adjacent: 6th St (running NW-SE) just N/NE, Commerce St ~90' NW, rail lines ~260' NW, and 91 Fwy ~940' NW (all running NE-SW) of LTNM1. Vacant project site buildings/land surrounding.

Weather: Overcast, skies clearing. Sunset/rise 7:56 PM /5:39 AM **Settings:** SLOW FAST

Temperature: 55-78 deg F **Wind:** 2-10 mph **Humidity:** 61-80% **Terrain:** Flat

Start Time: 7:00 PM **End Time:** 7:00 PM **Run Time:**

Leq: 70.5 dB **Primary Noise Source:** Trains passing microphone traveling along rail lines ~260' NW of LTNM1.

Lmax 101.3 dB Train horn when approaching and passing rail crossings. Train crossing bells.

L2 73.0 dB **Secondary Noise Sources:** Vehicular noise from 91 Fwy and other roads. Overhead air traffic. Residential

L8 64.8 dB ambiance. Pedestrians. Bird song. Crickets at night.

L25 59.4 dB

L50 56.2 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/1/2023		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking SW across site area towards building 3093 Mission Inn Avenue, Riverside.

LTNM1 looking NW along 6th Street towards Commerce Street intersection (~90'). 3 rail lines beyond intersection (~260').

Summary	
File Name on Meter	LxT_Data.288.s
File Name on PC	LxT_0003099-20230601 190000-LxT_Data.288.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	LTNM1 33°58'49.06"N 117°21'55.93"W
Job Description	24 hour noise measurement (24 x 1 hours)
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside

Measurement	
Start	2023-06-01 19:00:00
Stop	2023-06-02 19:00:00
Duration	24:00:00.0
Run Time	24:00:00.0
Pause	00:00:00.0
Pre-Calibration	2023-06-01 17:50:57
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	122.8 dB

Results			
LA_{eq}	70.5		
LAE	119.8		
EA	106.941	mPa^2h	
EA8	35.647	mPa^2h	
EA40	178.235	mPa^2h	
$LA_{peak\ (max)}$	2023-06-02 13:27:15	115.8	dB
LAS_{max}	2023-06-02 13:27:15	101.3	dB
LAS_{min}	2023-06-02 02:08:16	46.6	dB

			Statistics	
LC_{eq}	76.3	dB	**LA2.00**	73.0 dB
LA_{eq}	70.5	dB	**LA8.00**	64.8 dB
LC_{eq} - LA_{eq}	5.8	dB	**LA25.00**	59.4 dB
LAI_{eq}	73.1	dB	**LA50.00**	56.2 dB
LA_{eq}	70.5	dB	**LA90.00**	51.9 dB
LAI_{eq} - LA_{eq}	2.6	dB	**LA99.00**	49.3 dB
Overload Count	0			

Record #	Date	Time	Run Duration	Run Time	Pause	LAeq	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2023-06-01	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	75.6	56.1	19:42:05	98.6	19:45:24	82.7	69.4	63.1	60.3	58.5	57.5
2	2023-06-01	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	71.5	53.4	20:50:59	95.7	20:46:57	75.7	66.1	59.5	57.8	55.7	54.4
3	2023-06-01	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.2	52.9	21:26:21	95.0	21:48:25	76.5	62.2	56.9	55.9	54.8	53.8
4	2023-06-01	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	68.9	51.9	22:53:30	94.8	22:24:21	73.4	61.9	56.4	55.3	53.9	52.9
5	2023-06-01	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.4	49.8	23:05:54	94.5	23:33:14	63.6	57.9	55.3	54.3	52.7	51.2
6	2023-06-02	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.5	49.7	00:25:34	65.0	00:54:53	56.6	55.2	54.1	53.1	51.4	50.4
7	2023-06-02	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.7	46.8	01:31:53	95.6	01:02:16	69.4	60.1	53.1	51.9	49.8	48.1
8	2023-06-02	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	71.7	46.6	02:08:16	96.4	02:50:28	78.1	67.1	55.0	52.4	50.0	47.8
9	2023-06-02	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	73.5	47.5	03:21:05	97.7	03:02:20	75.6	64.2	53.8	52.0	49.9	48.6
10	2023-06-02	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	56.5	48.0	04:00:52	80.5	04:49:16	59.8	56.5	55.3	54.3	51.7	50.0
11	2023-06-02	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.2	52.0	05:18:43	94.0	05:21:21	70.0	60.7	57.0	56.0	54.1	52.9
12	2023-06-02	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	68.5	53.6	06:54:23	95.1	06:44:20	67.4	62.6	57.2	56.2	54.9	54.3
13	2023-06-02	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	72.5	51.8	07:28:18	96.2	07:37:28	78.8	67.2	58.0	55.7	53.3	52.2
14	2023-06-02	08:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.1	52.9	08:56:59	95.8	08:39:07	68.7	63.8	57.6	56.6	55.0	53.8
15	2023-06-02	09:00:00	01:00:00.0	01:00:00.0	00:00:00.0	69.4	52.6	09:12:57	95.6	09:04:24	71.6	65.5	57.3	56.3	54.9	53.9
16	2023-06-02	10:00:00	01:00:00.0	01:00:00.0	00:00:00.0	67.9	48.5	10:55:27	95.4	10:48:50	71.9	64.8	56.5	54.4	50.8	49.4
17	2023-06-02	11:00:00	01:00:00.0	01:00:00.0	00:00:00.0	68.8	47.9	11:06:28	99.5	11:35:42	71.9	61.7	53.7	52.2	49.5	48.4
18	2023-06-02	12:00:00	01:00:00.0	01:00:00.0	00:00:00.0	61.0	49.9	12:00:53	89.6	12:58:20	66.7	59.3	56.6	54.6	51.9	50.7
19	2023-06-02	13:00:00	01:00:00.0	01:00:00.0	00:00:00.0	73.8	52.1	13:13:50	101.3	13:27:15	69.7	60.4	58.0	56.4	54.3	53.1
20	2023-06-02	14:00:00	01:00:00.0	01:00:00.0	00:00:00.0	72.2	53.2	14:50:26	98.6	14:44:32	79.7	68.8	60.1	57.8	55.5	53.9
21	2023-06-02	15:00:00	01:00:00.0	01:00:00.0	00:00:00.0	71.8	55.3	15:01:49	96.9	15:23:44	76.8	66.7	61.5	59.2	57.3	56.1
22	2023-06-02	16:00:00	01:00:00.0	01:00:00.0	00:00:00.0	71.4	55.1	16:18:41	98.3	16:50:08	67.7	63.5	60.6	59.6	57.6	56.4
23	2023-06-02	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	70.8	56.8	17:01:46	96.4	17:52:45	73.3	66.3	61.7	60.8	59.1	57.9
24	2023-06-02	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	71.6	58.3	18:40:17	95.5	18:21:43	77.6	68.3	62.4	61.4	60.0	59.0

Measurement Report

Report Summary

Meter's File Name	LxT_Data.288.s	Computer's File Name	LxT_0003099-20230601 190000-LxT_Data.288.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	LTNM1 33°58'49.06"N 117°21'55.93"W
Job Description	24 hour noise measurement (24 x 1 hours)		
Note	Ganddini Project 19630 Iron Lofts Multifamily Residential, City of Riverside.		
Start Time	2023-06-01 19:00:00	Duration	24:00:00.0
End Time	2023-06-02 19:00:00	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	70.5 dB		
LAE	119.8 dB	SEA	--- dB
EA	106.9 mPa²h	LAFTM5	76.1 dB
EA8	35.6 mPa²h		
EA40	178.2 mPa²h		
LA_{peak}	115.8 dB	2023-06-02 13:27:15	
LAS_{max}	101.3 dB	2023-06-02 13:27:15	
LAS_{min}	46.6 dB	2023-06-02 02:08:16	
LA_{eq}	70.5 dB		
LC_{eq}	76.3 dB	LC_{eq} - LA_{eq}	5.8 dB
LAI_{eq}	73.1 dB	LAI_{eq} - LA_{eq}	2.6 dB

Exceedances	Count	Duration
LAS > 65.0 dB	286	2:10:31.7
LAS > 85.0 dB	119	0:09:21.8
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

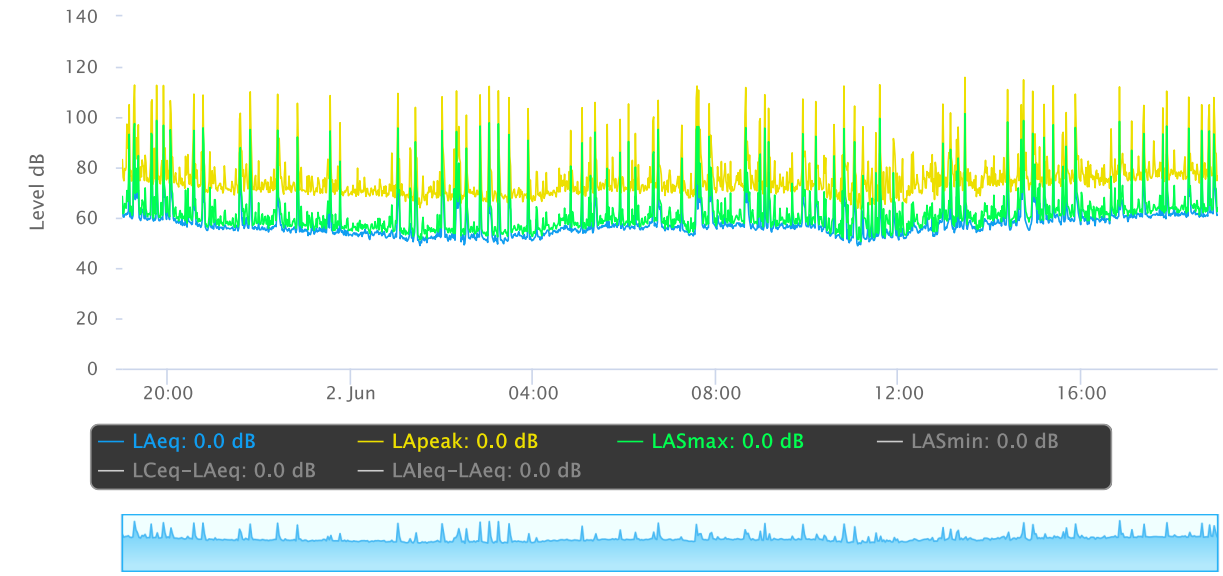
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	70.5 dB		76.3 dB		--- dB	
$L_{S(max)}$	101.3 dB	2023-06-02 13:27:15	--- dB		--- dB	
$L_{S(min)}$	46.6 dB	2023-06-02 02:08:16	--- dB		--- dB	
$L_{Peak(max)}$	115.8 dB	2023-06-02 13:27:15	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

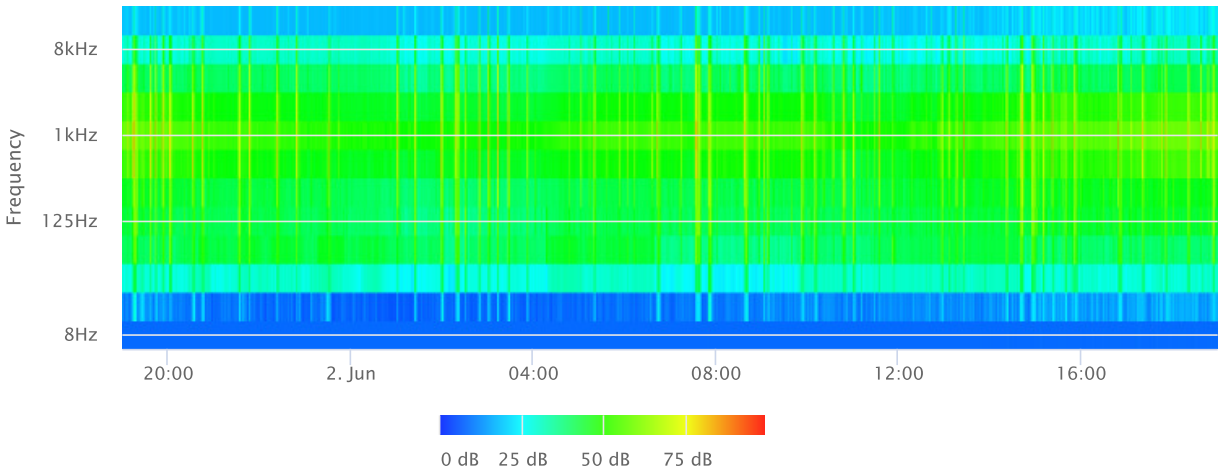
Statistics

LAS 2.0	73.0 dB
LAS 8.0	64.8 dB
LAS 25.0	59.4 dB
LAS 50.0	56.2 dB
LAS 90.0	51.9 dB
LAS 99.0	49.3 dB

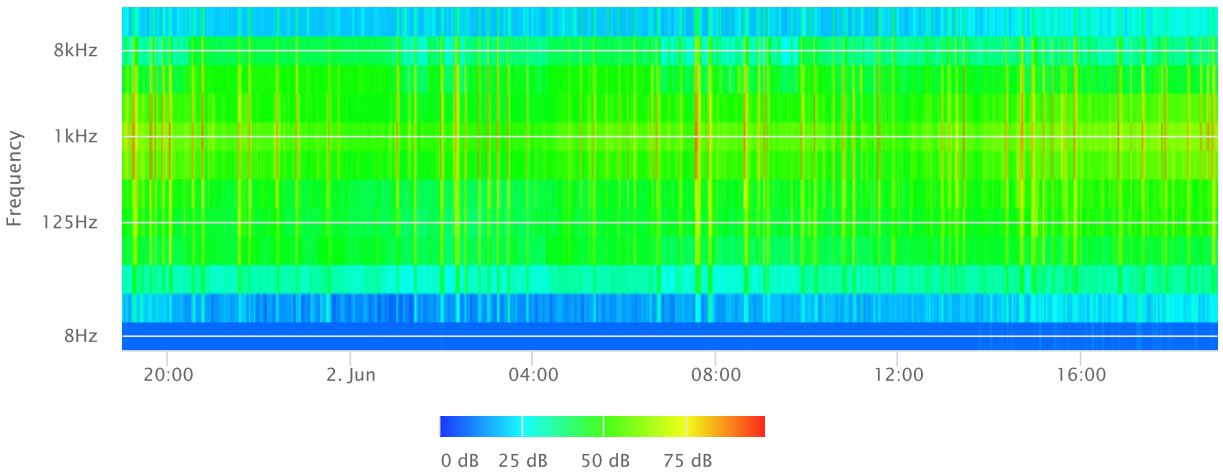
Time History



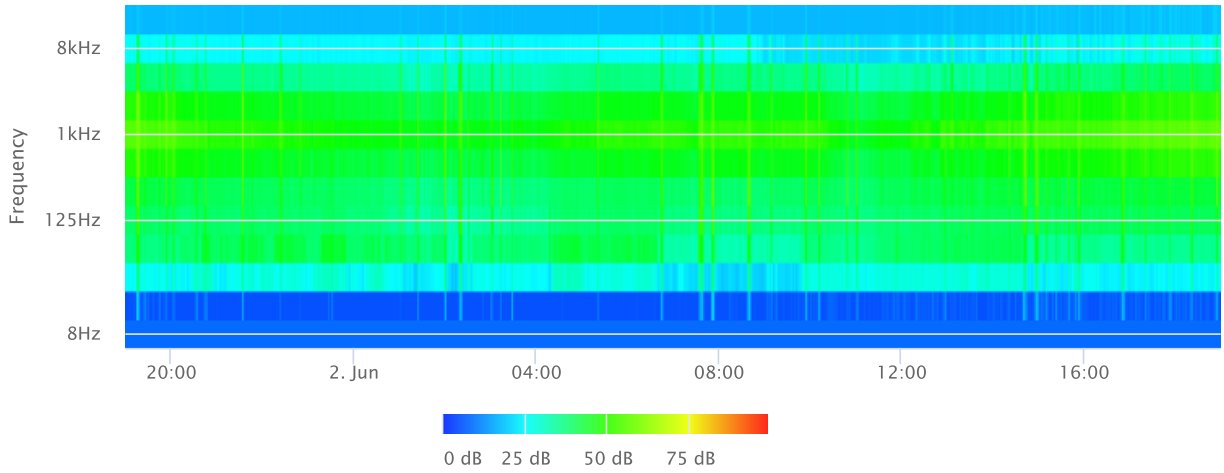
OBA 1/1 Leq



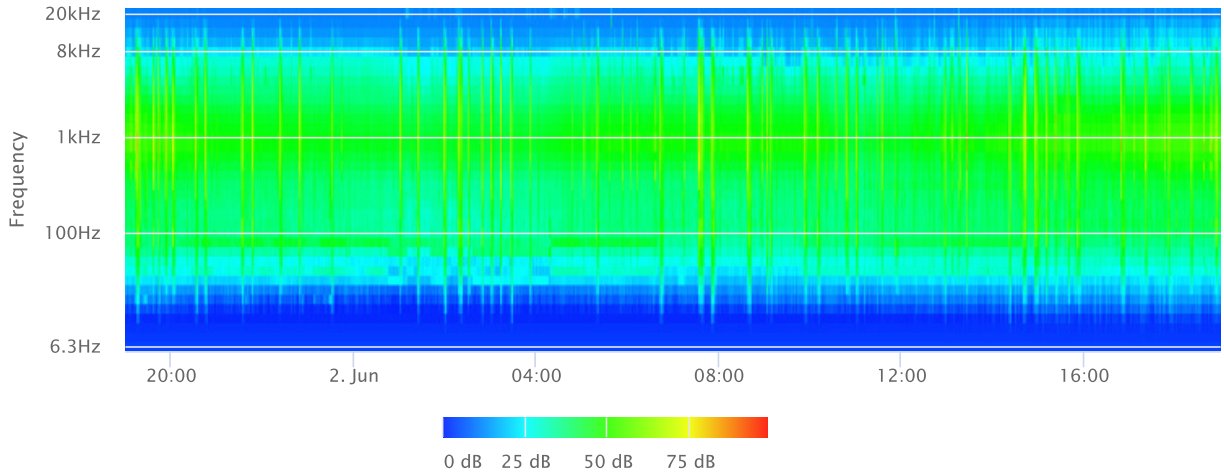
OBA 1/1 Lmax



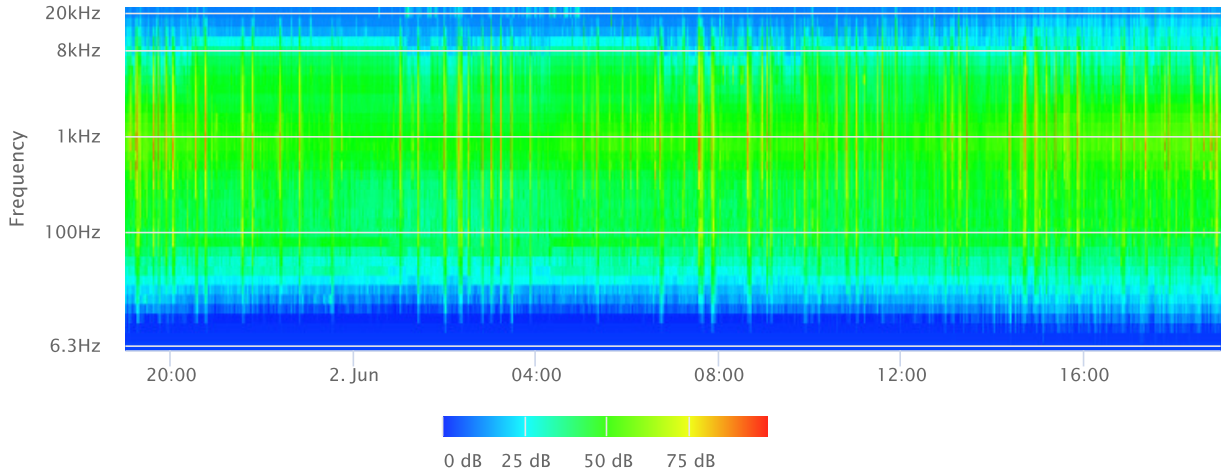
OBA 1/1 Lmin



OBA 1/3 Leq



OBA 1/3 Lmax



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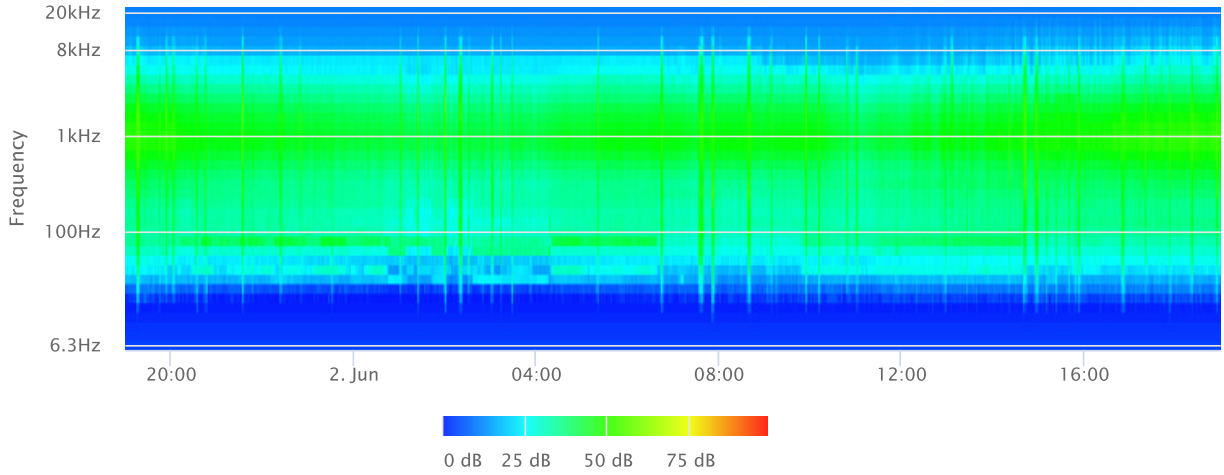
20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
20:00
2. Jun
04:00
08:00
12:00
16:00
0 dB
25 dB
50 dB
75 dB

APPENDIX D

CROSSING INVENTORY FORM

U. S. DOT CROSSING INVENTORY FORM

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk * denotes an optional field.

A. Revision Date (MM/DD/YYYY)	B. Reporting Agency	C. Reason for Update (Select only one)	D. DOT Crossing Inventory Number
12 / 17 / 2024	☒ Railroad ☐ Transit ☐ State ☐ Other	☒ Change in Data ☐ New Crossing ☐ Closed ☐ No Train Traffic ☐ Quiet Zone Update ☐ Re-Open ☐ Date Change Only ☐ Change in Primary Operating RR ☐ Admin. Correction	026485X

Part I: Location and Classification Information

1. Primary Operating Railroad	2. State	3. County
BNSF Railway Company [BNSF]	CALIFORNIA	RIVERSIDE

4. City / Municipality	5. Street/Road Name & Block Number	6. Highway Type & No.
☒ In ☐ Near RIVERSIDE	MISSION INN AVE (Street/Road Name) | * (Block Number)	ls

7. Do Other Railroads Operate a Separate Track at Crossing?	8. Do Other Railroads Operate Over Your Track at Crossing?
☐ Yes ☒ No If Yes, Specify RR	☒ Yes ☐ No If Yes, Specify RR ATK, UP

9. Railroad Division or Region	10. Railroad Subdivision or District	11. Branch or Line Name	12. RR Milepost
☐ None CALIFORNIA	☐ None SAN BERNARDINO	☐ None SAN BERN-REDO J	(prefix) | 0009.796 | (suffix)

13. Line Segment *	14. Nearest RR Timetable Station *	15. Parent RR (if applicable)	16. Crossing Owner (if applicable)
7602	ARLINGTON	☒ N/A	☐ N/A BNSF

17. Crossing Type	18. Crossing Purpose	19. Crossing Position	20. Public Access (if Private Crossing)	21. Type of Train	22. Average Passenger Train Count Per Day
☒ Public ☐ Private	☒ Highway ☐ Pathway, Ped. ☐ Station, Ped.	☒ At Grade ☐ RR Under ☐ RR Over	☐ Yes ☐ No	☒ Freight ☐ Transit ☒ Intercity Passenger ☐ Shared Use Transit ☐ Commuter ☐ Tourist/Other	☐ Less Than One Per Day ☒ Number Per Day 9

23. Type of Land Use
☐ Open Space ☐ Farm ☐ Residential ☒ Commercial ☐ Industrial ☐ Institutional ☐ Recreational ☐ RR Yard

24. Is there an Adjacent Crossing with a Separate Number?	25. Quiet Zone (FRA provided)
☐ Yes ☒ No If Yes, Provide Crossing Number	☒ No ☐ 24 Hr ☐ Partial ☐ Chicago Excused Date Established

26. HSR Corridor ID	27. Latitude in decimal degrees	28. Longitude in decimal degrees	29. Lat/Long Source
☒ N/A	(WGS84 std: nn.nnnnnnn) 33.9797370	(WGS84 std: -nnn.nnnnnnn) -117.366889	☒ Actual ☐ Estimated

30.A. Railroad Use *	31.A. State Use * CPUC 002B-9.75
30.B. Railroad Use *	31.B. State Use *
30.C. Railroad Use *	31.C. State Use *
30.D. Railroad Use *	31.D. State Use *
32.A. Narrative (Railroad Use) * (I.27 I.28 I.29)Value Provided by Railroad, Not Ye	32.B. Narrative (State Use) *

33. Emergency Notification Telephone No. (posted)	34. Railroad Contact (Telephone No.)	35. State Contact (Telephone No.)
800-832-5452	817-352-1549	415-703-3722

Part II: Railroad Information

1. Estimated Number of Daily Train Movements

1.A. Total Day Thru Trains (6 AM to 6 PM)	1.B. Total Night Thru Trains (6 PM to 6 AM)	1.C. Total Switching Trains	1.D. Total Transit Trains	1.E. Check if Less Than One Movement Per Day ☐ How many trains per week?
5	4	0	0	

2. Year of Train Count Data (YYYY)	3. Speed of Train at Crossing
2023	3.A. Maximum Timetable Speed (mph) 60 3.B. Typical Speed Range Over Crossing (mph) From 1 to 60

4. Type and Count of Tracks
Main 3 Siding 0 Yard 0 Transit 0 Industry 0

5. Train Detection (Main Track only)
☒ Constant Warning Time ☐ Motion Detection ☐AFO ☐ PTC ☐ DC ☐ Other ☐ None

6. Is Track Signaled?	7.A. Event Recorder	7.B. Remote Health Monitoring
☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

U. S. DOT CROSSING INVENTORY FORM

A. Revision Date *(MM/DD/YYYY)*	PAGE 2	D. Crossing Inventory Number *(7 char.)*
12/17/2024		026485X

Part III: Highway or Pathway Traffic Control Device Information

1. Are there Signs or Signals? ☒ Yes ☐ No

2. Types of Passive Traffic Control Devices associated with the Crossing

2.A. Crossbuck Assemblies *(count)*	2.B. STOP Signs *(R1-1)* *(count)*	2.C. YIELD Signs *(R1-2)* *(count)*	2.D. Advance Warning Signs *(Check all that apply; include count)* ☒ None
0	0	0	☐ W10-1 _____ ☐ W10-3 _____ ☐ W10-11 _____ ☐ W10-2 _____ ☐ W10-4 _____ ☐ W10-12 _____

2.E. Low Ground Clearance Sign *(W10-5)*	2.F. Pavement Markings	2.G. Channelization Devices/Medians	2.H. EXEMPT Sign *(R15-3)*	2.I. ENS Sign *(I-13)* Displayed
☐ Yes *(count_____)* ☒ No	☒ Stop Lines ☐ Dynamic Envelope ☒ RR Xing Symbols ☐ None	☒ All Approaches ☒ Median ☐ One Approach ☐ None	☐ Yes ☒ No	☒ Yes ☐ No

2.J. Other MUTCD Signs	2.K. Private Crossing Signs *(if private)*	2.L. LED Enhanced Signs *(List types)*
☒ Yes ☐ No Specify Type R15-8 Count 2 Specify Type _____ Count _____ Specify Type _____ Count _____	☐ Yes ☐ No	0

3. Types of Train Activated Warning Devices at the Grade Crossing *(specify count of each device for all that apply)*

3.A. Gate Arms *(count)*	3.B. Gate Configuration	3.C. Cantilevered *(or Bridged)* Flashing Light Structures *(count)*	3.D. Mast Mounted Flashing Lights *(count of masts)* 4	3.E. Total Count of Flashing Light Pairs
Roadway 4 Pedestrian 0	☒ 2 Quad ☐ Full *(Barrier)* Resistance ☐ 3 Quad ☐ 4 Quad ☒ Median Gates	Over Traffic Lane 0 ☐ Incandescent Not Over Traffic Lane 0 ☐ LED	☐ Incandescent ☒ LED ☐ Back Lights Included ☐ Side Lights Included	4

3.F. Installation Date of Current Active Warning Devices: *(MM/YYYY)*	3.G. Wayside Horn	3.H. Highway Traffic Signals Controlling Crossing	3.I. Bells *(count)*
_____/_____ ☐ Not Required	☐ Yes Installed on *(MM/YYYY)* _____/_____ ☐ No	☐ Yes ☒ No	2

3.J. Non-Train Active Warning	3.K. Other Flashing Lights or Warning Devices
☐ Flagging/Flagman ☐ Manually Operated Signals ☐ Watchman ☐ Floodlighting ☒ None	Count 0 Specify type _____

4.A. Does nearby Hwy Intersection have Traffic Signals?	4.B. Hwy Traffic Signal Interconnection	4.C. Hwy Traffic Signal Preemption	5. Highway Traffic Pre-Signals	6. Highway Monitoring Devices *(Check all that apply)*
☐ Yes ☒ No	☒ Not Interconnected ☐ For Traffic Signals ☐ For Warning Signs	☐ Simultaneous ☐ Advance	☐ Yes ☒ No Storage Distance * _____ Stop Line Distance * _____	☐ Yes - Photo/Video Recording ☐ Yes – Vehicle Presence Detection ☐ None

Part IV: Physical Characteristics

1. Traffic Lanes Crossing Railroad	2. Is Roadway/Pathway Paved?	3. Does Track Run Down a Street?	4. Is Crossing Illuminated? *(Street lights within approx. 50 feet from nearest rail)*
☐ One-way Traffic ☒ Two-way Traffic ☐ Divided Traffic Number of Lanes 4	☒ Yes ☐ No	☐ Yes ☒ No	☒ Yes ☐ No

5. Crossing Surface *(on Main Track, multiple types allowed)* Installation Date * *(MM/YYYY)* _____/_____ Width * _____ Length * _____
☐ 1 Timber ☐ 2 Asphalt ☐ 3 Asphalt and Timber ☒ 4 Concrete ☐ 5 Concrete and Rubber ☐ 6 Rubber ☐ 7 Metal
☐ 8 Unconsolidated ☐ 9 Composite ☐ 10 Other *(specify)* _____

6. Intersecting Roadway within 500 feet?	7. Smallest Crossing Angle	8. Is Commercial Power Available? *
☒ Yes ☐ No If Yes, Approximate Distance *(feet)* _____	☐ 0° – 29° ☐ 30° – 59° ☒ 60° - 90°	☒ Yes ☐ No

Part V: Public Highway Information

1. Highway System	2. Functional Classification of Road at Crossing	3. Is Crossing on State Highway System?	4. Highway Speed Limit
☐ (01) Interstate Highway System ☐ (02) Other Nat Hwy System (NHS) ☒ (03) Federal AID, Not NHS ☐ (08) Non-Federal Aid	☐ (0) Rural ☒ (1) Urban ☐ (1) Interstate ☐ (5) Major Collector ☐ (2) Other Freeways and Expressways ☐ (3) Other Principal Arterial ☐ (6) Minor Collector ☒ (4) Minor Arterial ☐ (7) Local	☐ Yes ☒ No	35 MPH ☐ Posted ☒ Statutory

5. Linear Referencing System *(LRS Route ID)* *

6. LRS Milepost *

7. Annual Average Daily Traffic *(AADT)*	8. Estimated Percent Trucks	9. Regularly Used by School Buses?	10. Emergency Services Route
Year 2017 AADT 4765	20 %	☐ Yes ☒ No Average Number per Day _____	☐ Yes ☐ No

Submission Information - *This information is used for administrative purposes and is not available on the public website.*

Submitted by _____ Organization _____ Phone _____ Date _____

APPENDIX E

CONSTRUCTION NOISE MODEL WORKSHEETS

Receptor - Commercial to Northwest (Gilmore's, 3496 Commerce Street, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	470	20	0.20	-19.5	-7.0	70.5	63.5
Excavators	3	81	470	40	1.20	-19.5	0.8	61.5	62.3
Rubber Tired Dozers	2	82	470	40	0.80	-19.5	-1.0	62.5	61.6
								Log Sum	67.3
Site Preparation									
Tractors/Loaders/Backhoes	4	84	422	40	1.60	-18.5	2.0	65.5	67.5
Rubber Tired Dozers	3	82	422	40	1.20	-18.5	0.8	63.5	64.3
								Log Sum	69.2
Grading									
Rubber Tired Dozers	1	82	422	40	0.40	-18.5	-4.0	63.5	59.5
Tractors/Loaders/Backhoes	3	84	422	40	1.20	-18.5	0.8	65.5	66.3
Excavators	1	81	422	40	0.40	-18.5	-4.0	62.5	58.5
Graders	1	85	422	40	0.40	-18.5	-4.0	66.5	62.5
								Log Sum	68.8
Building Construction									
Cranes	1	81	422	16	0.16	-18.5	-8.0	62.5	54.5
Forklifts[2]	3	48	422	40	1.20	-18.5	0.8	29.5	30.3
Generator Sets	1	81	422	50	0.50	-18.5	-3.0	62.5	59.5
Welders	1	74	422	40	0.40	-18.5	-4.0	55.5	51.5
Tractors/Loaders/Backhoes	3	84	422	40	1.20	-18.5	0.8	65.5	66.3
								Log Sum	67.4
Paving									
Pavers	2	77	422	50	1.00	-18.5	0.0	58.5	58.5
Paving Equipment	2	77	422	50	1.00	-18.5	0.0	58.5	58.5
Rollers	2	80	422	20	0.40	-18.5	-4.0	61.5	57.5
								Log Sum	62.9
Architectural Coating									
Air Compressors	1	78	422	40	0.40	-18.5	-4.0	59.5	55.5
								Log Sum	55.5

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Residential to Northast (2981 5th Street, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	612	20	0.20	-21.8	-7.0	68.2	61.3
Excavators	3	81	612	40	1.20	-21.8	0.8	59.2	60.0
Rubber Tired Dozers	2	82	612	40	0.80	-21.8	-1.0	60.2	59.3
								Log Sum	65.0
Site Preparation									
Tractors/Loaders/Backhoes	4	84	482	40	1.60	-19.7	2.0	64.3	66.4
Rubber Tired Dozers	3	82	482	40	1.20	-19.7	0.8	62.3	63.1
								Log Sum	68.0
Grading									
Rubber Tired Dozers	1	82	482	40	0.40	-19.7	-4.0	62.3	58.3
Tractors/Loaders/Backhoes	3	84	482	40	1.20	-19.7	0.8	64.3	65.1
Excavators	1	81	482	40	0.40	-19.7	-4.0	61.3	57.3
Graders	1	85	482	40	0.40	-19.7	-4.0	65.3	61.3
								Log Sum	67.7
Building Construction									
Cranes	1	81	482	16	0.16	-19.7	-8.0	61.3	53.4
Forklifts[2]	3	48	482	40	1.20	-19.7	0.8	28.3	29.1
Generator Sets	1	81	482	50	0.50	-19.7	-3.0	61.3	58.3
Welders	1	74	482	40	0.40	-19.7	-4.0	54.3	50.3
Tractors/Loaders/Backhoes	3	84	482	40	1.20	-19.7	0.8	64.3	65.1
								Log Sum	66.3
Paving									
Pavers	2	77	482	50	1.00	-19.7	0.0	57.3	57.3
Paving Equipment	2	77	482	50	1.00	-19.7	0.0	57.3	57.3
Rollers	2	80	482	20	0.40	-19.7	-4.0	60.3	56.3
								Log Sum	61.8
Architectural Coating									
Air Compressors	1	78	482	40	0.40	-19.7	-4.0	58.3	54.3
								Log Sum	54.3

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Residential to East (2981 6th Street, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	371	20	0.20	-17.4	-7.0	72.6	65.6
Excavators	3	81	371	40	1.20	-17.4	0.8	63.6	64.4
Rubber Tired Dozers	2	82	371	40	0.80	-17.4	-1.0	64.6	63.6
								Log Sum	69.4
Site Preparation									
Tractors/Loaders/Backhoes	4	84	212	40	1.60	-12.5	2.0	71.5	73.5
Rubber Tired Dozers	3	82	212	40	1.20	-12.5	0.8	69.5	70.2
								Log Sum	75.2
Grading									
Rubber Tired Dozers	1	82	212	40	0.40	-12.5	-4.0	69.5	65.5
Tractors/Loaders/Backhoes	3	84	212	40	1.20	-12.5	0.8	71.5	72.2
Excavators	1	81	212	40	0.40	-12.5	-4.0	68.5	64.5
Graders	1	85	212	40	0.40	-12.5	-4.0	72.5	68.5
								Log Sum	74.8
Building Construction									
Cranes	1	81	212	16	0.16	-12.5	-8.0	68.5	60.5
Forklifts[2]	3	48	212	40	1.20	-12.5	0.8	35.5	36.2
Generator Sets	1	81	212	50	0.50	-12.5	-3.0	68.5	65.4
Welders	1	74	212	40	0.40	-12.5	-4.0	61.5	57.5
Tractors/Loaders/Backhoes	3	84	212	40	1.20	-12.5	0.8	71.5	72.2
								Log Sum	73.4
Paving									
Pavers	2	77	212	50	1.00	-12.5	0.0	64.5	64.5
Paving Equipment	2	77	212	50	1.00	-12.5	0.0	64.5	64.5
Rollers	2	80	212	20	0.40	-12.5	-4.0	67.5	63.5
								Log Sum	68.9
Architectural Coating									
Air Compressors	1	78	212	40	0.40	-12.5	-4.0	65.5	61.5
								Log Sum	61.5

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Residential to East (2968 6th Street, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	360	20	0.20	-17.1	-7.0	72.9	65.9
Excavators	3	81	360	40	1.20	-17.1	0.8	63.9	64.6
Rubber Tired Dozers	2	82	360	40	0.80	-17.1	-1.0	64.9	63.9
								Log Sum	69.6
Site Preparation									
Tractors/Loaders/Backhoes	4	84	216	40	1.60	-12.7	2.0	71.3	73.3
Rubber Tired Dozers	3	82	216	40	1.20	-12.7	0.8	69.3	70.1
								Log Sum	75.0
Grading									
Rubber Tired Dozers	1	82	216	40	0.40	-12.7	-4.0	69.3	65.3
Tractors/Loaders/Backhoes	3	84	216	40	1.20	-12.7	0.8	71.3	72.1
Excavators	1	81	216	40	0.40	-12.7	-4.0	68.3	64.3
Graders	1	85	216	40	0.40	-12.7	-4.0	72.3	68.3
								Log Sum	74.6
Building Construction									
Cranes	1	81	216	16	0.16	-12.7	-8.0	68.3	60.3
Forklifts[2]	3	48	216	40	1.20	-12.7	0.8	35.3	36.1
Generator Sets	1	81	216	50	0.50	-12.7	-3.0	68.3	65.3
Welders	1	74	216	40	0.40	-12.7	-4.0	61.3	57.3
Tractors/Loaders/Backhoes	3	84	216	40	1.20	-12.7	0.8	71.3	72.1
								Log Sum	73.3
Paving									
Pavers	2	77	216	50	1.00	-12.7	0.0	64.3	64.3
Paving Equipment	2	77	216	50	1.00	-12.7	0.0	64.3	64.3
Rollers	2	80	216	20	0.40	-12.7	-4.0	67.3	63.3
								Log Sum	68.8
Architectural Coating									
Air Compressors	1	78	216	40	0.40	-12.7	-4.0	65.3	61.3
								Log Sum	61.3

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Avenue, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	505	20	0.20	-20.1	-7.0	69.9	62.9
Excavators	3	81	505	40	1.20	-20.1	0.8	60.9	61.7
Rubber Tired Dozers	2	82	505	40	0.80	-20.1	-1.0	61.9	60.9
								Log Sum	66.7
Site Preparation									
Tractors/Loaders/Backhoes	4	84	487	40	1.60	-19.8	2.0	64.2	66.3
Rubber Tired Dozers	3	82	487	40	1.20	-19.8	0.8	62.2	63.0
								Log Sum	68.0
Grading									
Rubber Tired Dozers	1	82	487	40	0.40	-19.8	-4.0	62.2	58.2
Tractors/Loaders/Backhoes	3	84	487	40	1.20	-19.8	0.8	64.2	65.0
Excavators	1	81	487	40	0.40	-19.8	-4.0	61.2	57.2
Graders	1	85	487	40	0.40	-19.8	-4.0	65.2	61.2
								Log Sum	67.6
Building Construction									
Cranes	1	81	487	16	0.16	-19.8	-8.0	61.2	53.3
Forklifts[2]	3	48	487	40	1.20	-19.8	0.8	28.2	29.0
Generator Sets	1	81	487	50	0.50	-19.8	-3.0	61.2	58.2
Welders	1	74	487	40	0.40	-19.8	-4.0	54.2	50.2
Tractors/Loaders/Backhoes	3	84	487	40	1.20	-19.8	0.8	64.2	65.0
								Log Sum	66.2
Paving									
Pavers	2	77	487	50	1.00	-19.8	0.0	57.2	57.2
Paving Equipment	2	77	487	50	1.00	-19.8	0.0	57.2	57.2
Rollers	2	80	487	20	0.40	-19.8	-4.0	60.2	56.2
								Log Sum	61.7
Architectural Coating									
Air Compressors	1	78	487	40	0.40	-19.8	-4.0	58.2	54.2
								Log Sum	54.2

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Residential to South (Mission Lofts Apartments, 3050 Mission Inn Avenue, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	407	20	0.20	-18.2	-7.0	71.8	64.8
Excavators	3	81	407	40	1.20	-18.2	0.8	62.8	63.6
Rubber Tired Dozers	2	82	407	40	0.80	-18.2	-1.0	63.8	62.8
								Log Sum	68.6
Site Preparation									
Tractors/Loaders/Backhoes	4	84	464	40	1.60	-19.4	2.0	64.6	66.7
Rubber Tired Dozers	3	82	464	40	1.20	-19.4	0.8	62.6	63.4
								Log Sum	68.4
Grading									
Rubber Tired Dozers	1	82	464	40	0.40	-19.4	-4.0	62.6	58.7
Tractors/Loaders/Backhoes	3	84	464	40	1.20	-19.4	0.8	64.6	65.4
Excavators	1	81	464	40	0.40	-19.4	-4.0	61.6	57.7
Graders	1	85	464	40	0.40	-19.4	-4.0	65.6	61.7
								Log Sum	68.0
Building Construction									
Cranes	1	81	464	16	0.16	-19.4	-8.0	61.6	53.7
Forklifts[2]	3	48	464	40	1.20	-19.4	0.8	28.6	29.4
Generator Sets	1	81	464	50	0.50	-19.4	-3.0	61.6	58.6
Welders	1	74	464	40	0.40	-19.4	-4.0	54.6	50.7
Tractors/Loaders/Backhoes	3	84	464	40	1.20	-19.4	0.8	64.6	65.4
								Log Sum	66.6
Paving									
Pavers	2	77	464	50	1.00	-19.4	0.0	57.6	57.6
Paving Equipment	2	77	464	50	1.00	-19.4	0.0	57.6	57.6
Rollers	2	80	464	20	0.40	-19.4	-4.0	60.6	56.7
								Log Sum	62.1
Architectural Coating									
Air Compressors	1	78	464	40	0.40	-19.4	-4.0	58.6	54.7
								Log Sum	54.7

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Commercial to Southwest (Mission Career College, 3750 Santa Fe Avenue, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	489	20	0.20	-19.8	-7.0	70.2	63.2
Excavators	3	81	489	40	1.20	-19.8	0.8	61.2	62.0
Rubber Tired Dozers	2	82	489	40	0.80	-19.8	-1.0	62.2	61.2
								Log Sum	67.0
Site Preparation									
Tractors/Loaders/Backhoes	4	84	626	40	1.60	-22.0	2.0	62.0	64.1
Rubber Tired Dozers	3	82	626	40	1.20	-22.0	0.8	60.0	60.8
								Log Sum	65.8
Grading									
Rubber Tired Dozers	1	82	626	40	0.40	-22.0	-4.0	60.0	56.1
Tractors/Loaders/Backhoes	3	84	626	40	1.20	-22.0	0.8	62.0	62.8
Excavators	1	81	626	40	0.40	-22.0	-4.0	59.0	55.1
Graders	1	85	626	40	0.40	-22.0	-4.0	63.0	59.1
								Log Sum	65.4
Building Construction									
Cranes	1	81	626	16	0.16	-22.0	-8.0	59.0	51.1
Forklifts[2]	3	48	626	40	1.20	-22.0	0.8	26.0	26.8
Generator Sets	1	81	626	50	0.50	-22.0	-3.0	59.0	56.0
Welders	1	74	626	40	0.40	-22.0	-4.0	52.0	48.1
Tractors/Loaders/Backhoes	3	84	626	40	1.20	-22.0	0.8	62.0	62.8
								Log Sum	64.0
Paving									
Pavers	2	77	626	50	1.00	-22.0	0.0	55.0	55.0
Paving Equipment	2	77	626	50	1.00	-22.0	0.0	55.0	55.0
Rollers	2	80	626	20	0.40	-22.0	-4.0	58.0	54.1
								Log Sum	59.5
Architectural Coating									
Air Compressors	1	78	626	40	0.40	-22.0	-4.0	56.0	52.1
								Log Sum	52.1

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Commercial to West (Safeway Electric, 3133 Mission Inn Avenue, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	265	20	0.20	-14.5	-7.0	75.5	68.5
Excavators	3	81	265	40	1.20	-14.5	0.8	66.5	67.3
Rubber Tired Dozers	2	82	265	40	0.80	-14.5	-1.0	67.5	66.5
								Log Sum	72.3
Site Preparation									
Tractors/Loaders/Backhoes	4	84	415	40	1.60	-18.4	2.0	65.6	67.7
Rubber Tired Dozers	3	82	415	40	1.20	-18.4	0.8	63.6	64.4
								Log Sum	69.3
Grading									
Rubber Tired Dozers	1	82	415	40	0.40	-18.4	-4.0	63.6	59.6
Tractors/Loaders/Backhoes	3	84	415	40	1.20	-18.4	0.8	65.6	66.4
Excavators	1	81	415	40	0.40	-18.4	-4.0	62.6	58.6
Graders	1	85	415	40	0.40	-18.4	-4.0	66.6	62.6
								Log Sum	69.0
Building Construction									
Cranes	1	81	415	16	0.16	-18.4	-8.0	62.6	54.7
Forklifts[2]	3	48	415	40	1.20	-18.4	0.8	29.6	30.4
Generator Sets	1	81	415	50	0.50	-18.4	-3.0	62.6	59.6
Welders	1	74	415	40	0.40	-18.4	-4.0	55.6	51.6
Tractors/Loaders/Backhoes	3	84	415	40	1.20	-18.4	0.8	65.6	66.4
								Log Sum	67.6
Paving									
Pavers	2	77	415	50	1.00	-18.4	0.0	58.6	58.6
Paving Equipment	2	77	415	50	1.00	-18.4	0.0	58.6	58.6
Rollers	2	80	415	20	0.40	-18.4	-4.0	61.6	57.6
								Log Sum	63.1
Architectural Coating									
Air Compressors	1	78	415	40	0.40	-18.4	-4.0	59.6	55.6
								Log Sum	55.6

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Commercial to West (3550 Vine Street, Riverside)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	275	20	0.20	-14.8	-7.0	75.2	68.2
Excavators	3	81	275	40	1.20	-14.8	0.8	66.2	67.0
Rubber Tired Dozers	2	82	275	40	0.80	-14.8	-1.0	67.2	66.2
								Log Sum	72.0
Site Preparation									
Tractors/Loaders/Backhoes	4	84	418	40	1.60	-18.4	2.0	65.6	67.6
Rubber Tired Dozers	3	82	418	40	1.20	-18.4	0.8	63.6	64.3
								Log Sum	69.3
Grading									
Rubber Tired Dozers	1	82	418	40	0.40	-18.4	-4.0	63.6	59.6
Tractors/Loaders/Backhoes	3	84	418	40	1.20	-18.4	0.8	65.6	66.3
Excavators	1	81	418	40	0.40	-18.4	-4.0	62.6	58.6
Graders	1	85	418	40	0.40	-18.4	-4.0	66.6	62.6
								Log Sum	68.9
Building Construction									
Cranes	1	81	418	16	0.16	-18.4	-8.0	62.6	54.6
Forklifts[2]	3	48	418	40	1.20	-18.4	0.8	29.6	30.3
Generator Sets	1	81	418	50	0.50	-18.4	-3.0	62.6	59.5
Welders	1	74	418	40	0.40	-18.4	-4.0	55.6	51.6
Tractors/Loaders/Backhoes	3	84	418	40	1.20	-18.4	0.8	65.6	66.3
								Log Sum	67.5
Paving									
Pavers	2	77	418	50	1.00	-18.4	0.0	58.6	58.6
Paving Equipment	2	77	418	50	1.00	-18.4	0.0	58.6	58.6
Rollers	2	80	418	20	0.40	-18.4	-4.0	61.6	57.6
								Log Sum	63.0
Architectural Coating									
Air Compressors	1	78	418	40	0.40	-18.4	-4.0	59.6	55.6
								Log Sum	55.6

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

APPENDIX F

SOUNDPLAN WORKSHEETS

Noise emissions of industry sources

Source name	Reference	Level			Corrections		
		Day	Evening	Night	Cwall	CI	CT
		dB(A)	dB(A)	dB(A)	dB	dB	dB
1	Lw/unit	126.0	130.0	125.0	-	-	-

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level Lden dB(A)	Conflict Lden dB
1	2	South west	EG	-	72.7	-
			1.OG	-	73.6	-
			2.OG	-	74.4	-
			3.OG	-	75.0	-
2		South west	EG	-	67.3	-
			1.OG	-	68.7	-
3	3	North west	EG	-	78.6	-
			1.OG	-	79.3	-
			2.OG	-	79.9	-
			3.OG	-	80.6	-
4	4	North west	EG	-	78.0	-
			1.OG	-	78.7	-
			2.OG	-	79.5	-
			3.OG	-	80.0	-
5	5	North west	EG	-	78.5	-
6	6	North west	EG	-	78.0	-
			1.OG	-	78.7	-
			2.OG	-	79.4	-
			3.OG	-	80.1	-
7	7	North east	EG	-	73.7	-
			1.OG	-	74.5	-
			2.OG	-	75.1	-
			3.OG	-	75.7	-
8	8	South east	EG	-	55.6	-
			1.OG	-	55.7	-
			2.OG	-	55.7	-
			3.OG	-	57.5	-
9	9	North west	EG	-	67.7	-
			1.OG	-	69.0	-
			2.OG	-	71.2	-
			3.OG	-	74.0	-
10	10	-	EG	-	57.0	-
11	11	-	EG	-	65.1	-
12	12	-	EG	-	63.7	-

APPENDIX G

FHWA TRAFFIC NOISE MODEL WORKSHEETS

Existing Traffic Noise

1	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	11200
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Lime Street	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 44
South of Mission Inn Avenue	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	648.64	13.44	22.40	481.54	2.24	3.73	119.41	18.67	31.11
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	22.37	5.54	7.76	21.08	-2.24	-0.03	15.02	6.96	9.18
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	62.97	55.85	63.29	61.67	48.07	55.51	55.62	57.28	64.71
	DAY LEQ	66.53		EVENING LEQ	62.76		NIGHT LEQ	65.87	

F		CNEL	72.42	Day hour	89.00
		DAY LEQ	66.53	Absorptive?	no
				Use hour?	no
				GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

1	:Id	
Lime Street	:Road	
South of Mission Inn Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	11350
Speed	35
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	657.32	13.62	22.70	487.99	2.27	3.78	121.01	18.92	31.53
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	22.43	5.60	7.81	21.14	-2.19	0.03	15.08	7.02	9.24
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.03	55.91	63.34	61.73	48.13	55.56	55.68	57.34	64.77
	DAY LEQ	66.59		EVENING LEQ	62.82		NIGHT LEQ	65.92	

CNEL	72.48
DAY LEQ	66.59

Day hour	89.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

2	:Id	Vehicle Distribution (Light Truck Mix)				ADT	5500
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mulberry Street	:Road					Speed	35
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
South of Mission Inn Avenue	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	337.31	4.12	1.60	249.28	0.73	0.73	62.44	5.50	2.14
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	19.53	0.41	-3.69	18.22	-7.10	-7.09	12.21	1.66	-2.44
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.38	51.97	53.09	60.06	44.46	49.69	54.05	53.22	54.34
	DAY LEQ	62.39		EVENING LEQ	60.55		NIGHT LEQ	58.67	

CNEL	66.10	Day hour	90.00
DAY LEQ	62.39	Absorptive?	no
		Use hour?	no
		GRADE dB	1.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

2	:Id	Vehicle Distribution (Light Truck Mix)				ADT	5650
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mulberry Street	:Road					Speed	35
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
South of Mission Inn Avenue	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	346.51	4.24	1.65	256.08	0.75	0.75	64.14	5.65	2.20
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	19.65	0.52	-3.58	18.34	-6.98	-6.97	12.32	1.77	-2.33
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.50	52.09	53.20	60.18	44.58	49.81	54.17	53.34	54.45
	DAY LEQ	62.51		EVENING LEQ	60.67		NIGHT LEQ	58.78	

CNEL	66.22	Day hour	90.00
DAY LEQ	62.51	Absorptive?	no
		Use hour?	no
		GRADE dB	1.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

3	:Id	Vehicle Distribution (Light Truck Mix)				ADT	1000
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Commerce Street	:Road					Speed	25
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
3rd Street to 5th Street	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	61.33	0.75	0.29	45.32	0.13	0.13	11.35	1.00	0.39
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	13.59	-5.53	-9.64	12.28	-13.04	-13.03	6.27	-4.29	-8.39
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.77	42.29	44.34	48.45	34.78	40.94	42.44	43.54	45.59
	DAY LEQ	51.43		EVENING LEQ	49.32		NIGHT LEQ	48.83	

CNEL	55.90	Day hour	91.00
DAY LEQ	51.43	Absorptive?	no
		Use hour?	no
		GRADE dB	2.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

3	:Id	Vehicle Distribution (Light Truck Mix)				ADT	1120
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Commerce Street	:Road					Speed	25
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
3rd Street to 5th Street	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	68.69	0.84	0.33	50.76	0.15	0.15	12.71	1.12	0.44
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	14.08	-5.04	-9.14	12.77	-12.55	-12.54	6.76	-3.79	-7.89
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	50.26	42.78	44.83	48.94	35.27	41.43	42.93	44.03	46.08
	DAY LEQ	51.92		EVENING LEQ	49.81		NIGHT LEQ	49.32	

CNEL	56.40	Day hour	91.00
DAY LEQ	51.92	Absorptive?	no
		Use hour?	no
		GRADE dB	2.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

4	:Id
Commerce Street	:Road
5th Street to Mission Inn Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1000
Speed	25
Distance	33
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	61.33	0.75	0.29	45.32	0.13	0.13	11.35	1.00	0.39
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	13.59	-5.53	-9.64	12.28	-13.04	-13.03	6.27	-4.29	-8.39
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.77	42.29	44.34	48.45	34.78	40.94	42.44	43.54	45.59
	DAY LEQ	51.43		EVENING LEQ	49.32		NIGHT LEQ	48.83	

CNEL	55.90
DAY LEQ	51.43

Day hour	92.00
Absorptive?	no
Use hour?	no
GRADE dB	3.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

4	:Id
Commerce Street	:Road
5th Street to Mission Inn Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1200
Speed	25
Distance	33
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	73.60	0.90	0.35	54.39	0.16	0.16	13.62	1.20	0.47
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	14.38	-4.74	-8.84	13.07	-12.25	-12.24	7.06	-3.49	-7.59
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	50.56	43.08	45.13	49.24	35.57	41.73	43.23	44.33	46.38
	DAY LEQ	52.22		EVENING LEQ	50.11		NIGHT LEQ	49.62	

CNEL	56.70
DAY LEQ	52.22

Day hour	92.00
Absorptive?	no
Use hour?	no
GRADE dB	3.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

5	:Id	Vehicle Distribution (Light Truck Mix)				ADT	2000
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Commerce Street	:Road					Speed	25
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
South of Mission Inn Avenue	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	122.66	1.50	0.58	90.65	0.27	0.27	22.71	2.00	0.78
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.60	-2.52	-6.63	15.29	-10.03	-10.02	9.28	-1.28	-5.38
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	52.78	45.30	47.35	51.46	37.79	43.95	45.45	46.55	48.60
	DAY LEQ	54.44		EVENING LEQ	52.33		NIGHT LEQ	51.84	

CNEL	58.91	Day hour	93.00
DAY LEQ	54.44	Absorptive?	no
		Use hour?	no
		GRADE dB	4.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

5	:Id	Vehicle Distribution (Light Truck Mix)				ADT	2060
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Commerce Street	:Road					Speed	25
		Automobiles	75.56	13.96	10.49	97.40	Distance 33
South of Mission Inn Avenue	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Left Angle -90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	126.34	1.54	0.60	93.37	0.27	0.27	23.39	2.06	0.80
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.73	-2.40	-6.50	15.42	-9.91	-9.89	9.40	-1.15	-5.25
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	52.90	45.43	47.48	51.59	37.92	44.08	45.58	46.67	48.73
	DAY LEQ	54.56		EVENING LEQ	52.46		NIGHT LEQ	51.97	

CNEL	59.04	Day hour	93.00
DAY LEQ	54.56	Absorptive?	no
		Use hour?	no
		GRADE dB	4.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

6	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	9800
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	25
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
West of Lime Stret	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	567.56	11.76	19.60	421.35	1.96	3.27	104.49	16.33	27.22
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	23.25	6.42	8.64	21.96	-1.36	0.86	15.91	7.85	10.06
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	57.62	52.44	60.81	56.33	44.65	53.03	50.28	53.86	62.23
	DAY LEQ	62.92		EVENING LEQ	58.19		NIGHT LEQ	63.06	

CNEL	69.46	Day hour	94.00
DAY LEQ	62.92	Absorptive?	no
		Use hour?	no
		GRADE dB	5.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

6	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	9980
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	25
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
West of Lime Stret	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	577.98	11.98	19.96	429.09	2.00	3.33	106.40	16.63	27.72
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	23.33	6.50	8.72	22.04	-1.28	0.93	15.98	7.92	10.14
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	57.70	52.52	60.89	56.41	44.73	53.11	50.35	53.94	62.31
	DAY LEQ	63.00		EVENING LEQ	58.27		NIGHT LEQ	63.14	

CNEL	69.54	Day hour	94.00
DAY LEQ	63.00	Absorptive?	no
		Use hour?	no
		GRADE dB	5.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

7	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	14000
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
Lime Street to Mulberry Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	810.80	16.80	28.00	601.93	2.80	4.67	149.26	23.33	38.89
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	23.34	6.51	8.73	22.05	-1.27	0.94	15.99	7.93	10.15
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.38	56.26	63.70	62.09	48.48	55.92	56.03	57.69	65.13
	DAY LEQ	66.94		EVENING LEQ	63.18		NIGHT LEQ	66.28	

CNEL	72.84	Day hour	95.00
DAY LEQ	66.94	Absorptive?	no
		Use hour?	no
		GRADE dB	6.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

7	:Id
Mission Inn Avenue	:Road
Lime Street to Mulberry Street	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	14330
Speed	35
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	829.91	17.20	28.66	616.11	2.87	4.78	152.78	23.88	39.81
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	23.44	6.61	8.83	22.15	-1.17	1.04	16.09	8.03	10.25
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.48	56.37	63.80	62.19	48.58	56.02	56.13	57.79	65.23
	DAY LEQ	67.04		EVENING LEQ	63.28		NIGHT LEQ	66.38	

CNEL	72.94
DAY LEQ	67.04

Day hour	95.00
Absorptive?	no
Use hour?	no
GRADE dB	6.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

8	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	8100
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
Mulberry Street to Vine Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	469.10	9.72	16.20	348.26	1.62	2.70	86.36	13.50	22.50
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	20.97	4.13	6.35	19.67	-3.65	-1.43	13.62	5.56	7.78
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.01	53.89	61.32	59.71	46.11	53.54	53.66	55.31	62.75
	DAY LEQ	64.57		EVENING LEQ	60.80		NIGHT LEQ	63.90	

CNEL	70.46	Day hour	96.00
DAY LEQ	64.57	Absorptive?	no
		Use hour?	no
		GRADE dB	7.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

8	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	8830
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
Mulberry Street to Vine Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	511.38	10.60	17.66	379.64	1.77	2.94	94.14	14.72	24.53
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	21.34	4.50	6.72	20.05	-3.28	-1.06	13.99	5.93	8.15
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.38	54.26	61.70	60.09	46.48	53.92	54.03	55.69	63.13
	DAY LEQ	64.94		EVENING LEQ	61.18		NIGHT LEQ	64.28	

CNEL	70.83	Day hour	96.00
DAY LEQ	64.94	Absorptive?	no
		Use hour?	no
		GRADE dB	7.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

9	:Id
Mission Inn Avenue	:Road
Vine Street to Commerce Street	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	6000
Speed	35
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	347.48	7.20	12.00	257.97	1.20	2.00	63.97	10.00	16.67
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	19.66	2.83	5.05	18.37	-4.95	-2.74	12.31	4.25	6.47
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	59.70	52.58	60.02	58.41	44.80	52.24	52.35	54.01	61.45
	DAY LEQ	63.26		EVENING LEQ	59.50		NIGHT LEQ	62.60	

CNEL	**69.16**
DAY LEQ	63.26

Day hour	97.00
Absorptive?	no
Use hour?	no
GRADE dB	8.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

9	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	6630
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
Vine Street to Commerce Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	383.97	7.96	13.26	285.05	1.33	2.21	70.69	11.05	18.42
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	20.10	3.26	5.48	18.80	-4.52	-2.30	12.75	4.69	6.91
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	60.14	53.02	60.45	58.84	45.24	52.67	52.79	54.45	61.88
	DAY LEQ	63.70		EVENING LEQ	59.93		NIGHT LEQ	63.03	

F		CNEL	69.59	Day hour	97.00
		DAY LEQ	63.70	Absorptive?	no
				Use hour?	no
				GRADE dB	8.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

10	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	4600
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
East of Commerce Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	266.40	5.52	9.20	197.78	0.92	1.53	49.04	7.67	12.78
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	18.51	1.67	3.89	17.22	-6.11	-3.89	11.16	3.10	5.32
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	58.55	51.43	58.87	57.25	43.65	51.09	51.20	52.86	60.29
	DAY LEQ	62.11		EVENING LEQ	58.34		NIGHT LEQ	61.45	

CNEL	68.00	Day hour	98.00
DAY LEQ	62.11	Absorptive?	no
		Use hour?	no
		GRADE dB	9.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

10	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	5330
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
East of Commerce Street	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	308.68	6.40	10.66	229.16	1.07	1.78	56.83	8.88	14.81
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	19.15	2.31	4.53	17.85	-5.47	-3.25	11.80	3.74	5.96
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	59.19	52.07	59.51	57.89	44.29	51.73	51.84	53.50	60.93
	DAY LEQ	62.75		EVENING LEQ	58.98		NIGHT LEQ	62.09	

CNEL	68.64	Day hour	98.00
DAY LEQ	62.75	Absorptive?	no
		Use hour?	no
		GRADE dB	9.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

11	:Id	
Mission Inn Avenue	:Road	
West of Park Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	4300
Speed	35
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	249.03	5.16	8.60	184.88	0.86	1.43	45.85	7.17	11.94
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	18.22	1.38	3.60	16.92	-6.40	-4.18	10.87	2.81	5.03
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	58.26	51.14	58.57	56.96	43.36	50.79	50.91	52.56	60.00
	DAY LEQ	61.82		EVENING LEQ	58.05		NIGHT LEQ	61.15	

CNEL	67.71
DAY LEQ	61.82

Day hour	99.00
Absorptive?	no
Use hour?	no
GRADE dB	10.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

11	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	4360
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
West of Park Avenue	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	252.51	5.23	8.72	187.46	0.87	1.45	46.49	7.27	12.11
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	18.28	1.44	3.66	16.98	-6.34	-4.12	10.93	2.87	5.09
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	58.32	51.20	58.63	57.02	43.42	50.85	50.97	52.62	60.06
	DAY LEQ	61.88		EVENING LEQ	58.11		NIGHT LEQ	61.21	

CNEL	67.77	Day hour	99.00
DAY LEQ	61.88	Absorptive?	no
		Use hour?	no
		GRADE dB	10.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

12	:Id	
Mission Inn Avenue	:Road	
East of Park Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2700
Speed	35
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	156.37	3.24	5.40	116.09	0.54	0.90	28.79	4.50	7.50
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	16.19	-0.64	1.58	14.90	-8.42	-6.20	8.85	0.79	3.00
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	56.23	49.12	56.55	54.94	41.34	48.77	48.89	50.54	57.98
	DAY LEQ	59.80		EVENING LEQ	56.03		NIGHT LEQ	59.13	

CNEL	65.69
DAY LEQ	59.80

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

12	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	2760
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Mission Inn Avenue	:Road					Speed	35
		Automobiles	75.54	14.02	10.43	92.00	Distance 50
East of Park Avenue	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	159.84	3.31	5.52	118.67	0.55	0.92	29.43	4.60	7.67
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	16.29	-0.55	1.67	15.00	-8.33	-6.11	8.94	0.88	3.10
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	56.33	49.21	56.65	55.04	41.43	48.87	48.98	50.64	58.08
	DAY LEQ	59.89		EVENING LEQ	56.13		NIGHT LEQ	59.23	

CNEL	65.78	Day hour	0.00
DAY LEQ	59.89	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

13	:Id	Vehicle Distribution (Light Truck Mix)				ADT	100
6th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 10 AM)	Total % of Traffic Flow	Speed	25
Project Site to Park Avenue	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	33
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	6.13	0.07	0.03	4.53	0.01	0.01	1.14	0.10	0.04
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	3.59	-15.53	-19.64	2.28	-23.04	-23.03	-3.73	-14.29	-18.39
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	39.77	32.29	34.34	38.45	24.78	30.94	32.44	33.54	35.59
	DAY LEQ	41.43		EVENING LEQ	39.32		NIGHT LEQ	38.83	

CNEL	45.90	Day hour	0.00
DAY LEQ	41.43	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

13	:Id	Vehicle Distribution (Light Truck Mix)				ADT	200
6th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
Project Site to Park Avenue	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	33
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	12.27	0.15	0.06	9.06	0.03	0.03	2.27	0.20	0.08
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	6.60	-12.52	-16.63	5.29	-20.03	-20.02	-0.72	-11.28	-15.38
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	42.78	35.30	37.35	41.46	27.79	33.95	35.45	36.55	38.60
	DAY LEQ	44.44		EVENING LEQ	42.33		NIGHT LEQ	41.84	

CNEL	48.91	Day hour	0.00
DAY LEQ	44.44	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

14	:Id	Vehicle Distribution (Light Truck Mix)				ADT	200
5th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
East of Commerce Stret	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	33
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	12.27	0.15	0.06	9.06	0.03	0.03	2.27	0.20	0.08
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	6.60	-12.52	-16.63	5.29	-20.03	-20.02	-0.72	-11.28	-15.38
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	42.78	35.30	37.35	41.46	27.79	33.95	35.45	36.55	38.60
	DAY LEQ	44.44		EVENING LEQ	42.33		NIGHT LEQ	41.84	

CNEL	48.91	Day hour	0.00
DAY LEQ	44.44	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

14	:Id	Vehicle Distribution (Light Truck Mix)				ADT	520
5th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
East of Commerce Stret	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	33
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	31.89	0.39	0.15	23.57	0.07	0.07	5.90	0.52	0.20
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	10.75	-8.37	-12.48	9.44	-15.88	-15.87	3.43	-7.13	-11.23
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	46.93	39.45	41.50	45.61	31.94	38.10	39.60	40.70	42.75
	DAY LEQ	48.59		EVENING LEQ	46.48		NIGHT LEQ	45.99	

CNEL	53.06	Day hour	0.00
DAY LEQ	48.59	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

15	:Id	
5th Street	:Road	
West of Park Avenue	:Segment	

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	100
Speed	25
Distance	33
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	6.13	0.07	0.03	4.53	0.01	0.01	1.14	0.10	0.04
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	3.59	-15.53	-19.64	2.28	-23.04	-23.03	-3.73	-14.29	-18.39
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	39.77	32.29	34.34	38.45	24.78	30.94	32.44	33.54	35.59
	DAY LEQ	41.43		EVENING LEQ	39.32		NIGHT LEQ	38.83	

CNEL	45.90
DAY LEQ	41.43

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

15	:Id	Vehicle Distribution (Light Truck Mix)				ADT	220
5th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
West of Park Avenue	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	33
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	13.49	0.16	0.06	9.97	0.03	0.03	2.50	0.22	0.09
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	7.02	-12.11	-16.21	5.70	-19.62	-19.61	-0.31	-10.86	-14.96
Distance	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	43.19	35.71	37.76	41.88	28.20	34.37	35.86	36.96	39.01
	DAY LEQ	44.85		EVENING LEQ	42.74		NIGHT LEQ	42.25	

CNEL	49.33	Day hour	0.00
DAY LEQ	44.85	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

16	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	18700
3rd Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	30
West of Commerce Street	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	44
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1082.99	22.44	37.40	804.00	3.74	6.23	199.38	31.17	51.94
Speed in MPH	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	62.51	73.11	78.76	62.51	73.11	78.76	62.51	73.11	78.76
ADJUSTMENTS									
Flow	25.27	8.43	10.65	23.98	0.65	2.87	17.92	9.86	12.08
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.27	57.03	64.90	61.97	49.25	57.12	55.92	58.46	66.32
	DAY LEQ	67.57		EVENING LEQ	63.37		NIGHT LEQ	67.31	

CNEL	73.78	Day hour	0.00
DAY LEQ	67.57	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

16	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT 18760
3rd Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed 30
West of Commerce Street	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance 44
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle -90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1086.47	22.51	37.52	806.58	3.75	6.25	200.01	31.27	52.11
Speed in MPH	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	62.51	73.11	78.76	62.51	73.11	78.76	62.51	73.11	78.76
ADJUSTMENTS									
Flow	25.28	8.45	10.67	23.99	0.67	2.88	17.93	9.87	12.09
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.28	57.05	64.91	61.99	49.27	57.13	55.93	58.47	66.34
	DAY LEQ	67.58		EVENING LEQ	63.39		NIGHT LEQ	67.32	

CNEL	73.80	Day hour	0.00
DAY LEQ	67.58	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

17 :Id

3rd Street :Road

East of Commerce Street :Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	18300
Speed	40
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1059.83	21.96	36.60	786.80	3.66	6.10	195.11	30.50	50.83
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	23.93	7.09	9.31	22.63	-0.69	1.53	16.58	8.52	10.74
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.77	58.89	65.95	65.48	51.11	58.17	59.42	60.31	67.38
	DAY LEQ	69.76		EVENING LEQ	66.35		NIGHT LEQ	68.70	

CNEL	75.35
DAY LEQ	69.76

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

17	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	18360
3rd Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	40
East of Commerce Street	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	44
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1063.30	22.03	36.72	789.38	3.67	6.12	195.75	30.60	51.00
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	23.94	7.10	9.32	22.65	-0.68	1.54	16.59	8.53	10.75
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.79	58.90	65.97	65.49	51.12	58.19	59.44	60.33	67.39
	DAY LEQ	69.78		EVENING LEQ	66.36		NIGHT LEQ	68.72	

CNEL	75.36	Day hour	0.00
DAY LEQ	69.78	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

APPENDIX H

GROUNDBORNE VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 5th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	79.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.037	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 5th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	79.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.016	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2980 5th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.452	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2980 5th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.191	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 6th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.452	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 6th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.191	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2968 6th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	79.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.037	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2968 6th Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	79.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.016	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 Mission Inn Avenue, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	34.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.132	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:	2981 Mission Inn Avenue, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	34.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.056	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19630 Iron Lofts Multifamily Residential		Date: 1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to Southeast		
Address:	4 Word Living Sober Living Homes, 2992 Mission Inn Avenue, Riverside		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	118.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.020	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to Southeast		
Address:	4 Word Living Sober Living Homes, 2992 Mission Inn Avenue, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	118.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.009	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19630 Iron Lofts Multifamily Residential		Date: 1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:	Mission Lofts Apartments, 3050 Mission Inn Avenue, Riverside		
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	104.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.025	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:	Mission Lofts Apartments, 3050 Mission Inn Avenue, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	104.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.010	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial to Northwest		
Address:	Gilmore's, 3496 Commerce Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	55.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.064	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial to Northwest		
Address:	Gilmore's, 3496 Commerce Street, Riverside		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	55.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.027	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19630 Iron Lofts Multifamily Residential		Date: 1/28/25
Source:	Vibratory Roller		
Scenario:	Mitigated		
Location:	Threshold for Damage		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	26.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.198	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19630 Iron Lofts Multifamily Residential	Date:	1/28/25
Source:	Large Bulldozer		
Scenario:	Mitigated		
Location:	Threshold for Damage		
Address:			

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.191	IN/SEC	OUTPUT IN BLUE

Construction Annoyance Vibration Calculations

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

Eq. 7-3: Lvdistance = Lvref - 30log (D/25)

Lvdistance = the rms velocity level adjsuted for distance, VdB
Lvref = the source reference vibration level at 25 feet, VdB
D = distance from the equipment to th receiver, ft.

Large Bulldozer:

Residential to East (2981 5th Street, Riverside): Lvdistance = 87 - 30 log (79/25) = 72.01 VdB
Residential to East (2980 5th Street, Riverside): Lvdistance = 87 - 30 log (15/25) = 93.66 VdB
Residential to East (2981 6th Street, Riverside): Lvdistance = 87 - 30 log (15/25) = 93.66 VdB
Residential to East (2968 6th Street, Riverside): Lvdistance = 87 - 30 log (79/25) = 72.01 VdB
Residential to East (2981 Mission Inn Avenue, Riverside): Lvdistance = 87 - 30 log (34/25) = 82.99 VdB
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Avenue, Riverside): Lvdistance = 87 - 30 log (118/25) = 66.78 VdB
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Avenue, Riverside): Lvdistance = 87 - 30 log (104/25) = 68.43 VdB

Under Threshold Mitigation Distance: 87 - 30 log (43/25) = 79.93 VdB

Vibratory Roller:

Residential to East (2981 5th Street, Riverside): Lvdistance = 94 - 30 log (79/25) = 79.01 VdB
Residential to East (2980 5th Street, Riverside): Lvdistance = 94 - 30 log (15/25) = 100.66 VdB
Residential to East (2981 6th Street, Riverside): Lvdistance = 94 - 30 log (15/25) = 100.66 VdB
Residential to East (2968 6th Street, Riverside): Lvdistance = 94 - 30 log (79/25) = 79.01 VdB
Residential to East (2981 Mission Inn Avenue, Riverside): Lvdistance = 94 - 30 log (34/25) = 89.99 VdB
Residential to Southeast (4 Word Living Sober Living Homes, 2992 Mission Inn Avenue, Riverside): Lvdistance = 94 - 30 log (118/25) = 73.78 VdB
Residential to South (Mission Lofts Apartments, 3050 Mission Inn Avenue, Riverside): Lvdistance = 94 - 30 log (104/25) = 75.43 VdB

Under Threshold Mitigation Distance: 94 - 30 log (74/25) = 79.86 VdB

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