Appendix H1

Noise Impact Analysis

HARVILL TRAILER STORAGE YARD PROJECT NOISE IMPACT ANALYSIS

County of Riverside

January 19, 2022

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

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County of Riverside

January 19, 2022

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Project No. 19365

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EXECUTIVE SUMMARY

Project Location

The 7.24-acre project site is located at the northwest corner of Harvill Avenue and Orange Avenue in the County of Riverside, California.

Project Description

The proposed project involves construction of a 16,200 square foot maintenance building for a surface trailer storage yard with 167 trailer stalls and 38 vehicle parking stalls. Vehicular access is proposed at Orange Avenue.

Construction Impacts

Modeled unmitigated construction noise levels when combined with existing measured noise levels could reach 67.3 dBA L_{eq} at the nearest residential property lines to the south, 68.2 dBA L_{eq} at the nearest residential property lines to the southwest, 62.7 dBA L_{eq} at the nearest residential property lines to the west, 71.1 dBA L_{eq} at the nearest industrial property lines to the east, and up to 63.6 dBA L_{eq} at the nearest commercial property lines to the southeast of the project site.

Proposed project construction is expected to comply with County Code which limits the hours of operation for construction. Applicable noise thresholds would not be exceeded. Construction noise would not be significant. No mitigation is required, however, recommended best management practices to reduce noise emissions are presented below.

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

Project generated vehicle noise along affected roadways was modeled utilizing a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

For purposes of this project, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the County's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

As shown in Table 10, project generated vehicle traffic will result in an increase of 9.1 dBA CNEL along the right-of-way of Orange Avenue between the western project driveway and Harvill Avenue. Existing noise levels along the right-of-way at this area do not currently exceed what considered "normally acceptable" for residential land uses (60 dBA CNEL). Further, project generated traffic in will not cause ambient noise levels at this area to exceed 60 dBA CNEL.

Project generated vehicle traffic will result in an increase of 0.4 dBA CNEL along the right-of-way of Harvill Avenue north and south of Orange Avenue. Increases in ambient noise levels due to project generated vehicle traffic will be less than significant. No mitigation is required.

Transportation Noise Impacts to the Proposed Project

Vehicle noise at the project site associated with Harvill Avenue was modeled using FHWA Traffic Noise Prediction Model FHWA-RD-77-108 formulas. The exterior noise levels at the proposed project site are anticipated to fall within the County's normally acceptable exterior noise standards for industrial uses.

Impacts related to future traffic noise impacts to the proposed project would be less than significant. No mitigation is required.

Noise Impacts to Off-Site Receptors Due to On-Site Operational Noise

The SoundPLAN noise model was utilized to estimate project peak hour operational noise at sensitive receptors in order to determine if it is likely to exceed the County's noise thresholds at sensitive receptors. Peak hour project operation is expected to range between 39 and 45 dBA L_{eq} at the nearest sensitive receptors and is not expected to exceed the County's exterior daytime noise threshold of 65 dBA L_{eq} nor the nighttime noise threshold of 45 dBA L_{eq}. Project operational noise levels would be considered less than significant. No mitigation is required.

Groundborne Vibration Impacts

Construction equipment is anticipated to be located at a distance of at least 350 feet or more from any sensitive receptor. Temporary vibration levels associated with project construction would not exceed architectural damage or annoyance standards and would therefore be less than significant. No mitigation is required.

Best Management Practices

In addition to adherence to the County of Riverside Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

2. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Equipment shall be shut off and not left to idle when not in use.

4. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded, and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

1. INTRODUCTION

This section describes the purpose of this noise impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise and vibration impacts resulting from development of the proposed Harvill Trailer Storage Yard project and to identify mitigation measures that may be necessary to reduce those impacts. The noise and vibration 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 County of Riverside.

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 analysis.

PROJECT LOCATION

The 7.24-acre project site is located at the northwest corner of Harvill Avenue and Orange Avenue in the County of Riverside, California. A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

The proposed project involves construction of a 16,200 square foot maintenance building for a surface trailer storage yard with 167 trailer stalls and 38 vehicle parking stalls. Vehicular access is proposed at Orange Avenue. Figure 2 illustrates the project site plan.

Figure 1
Project Location Map

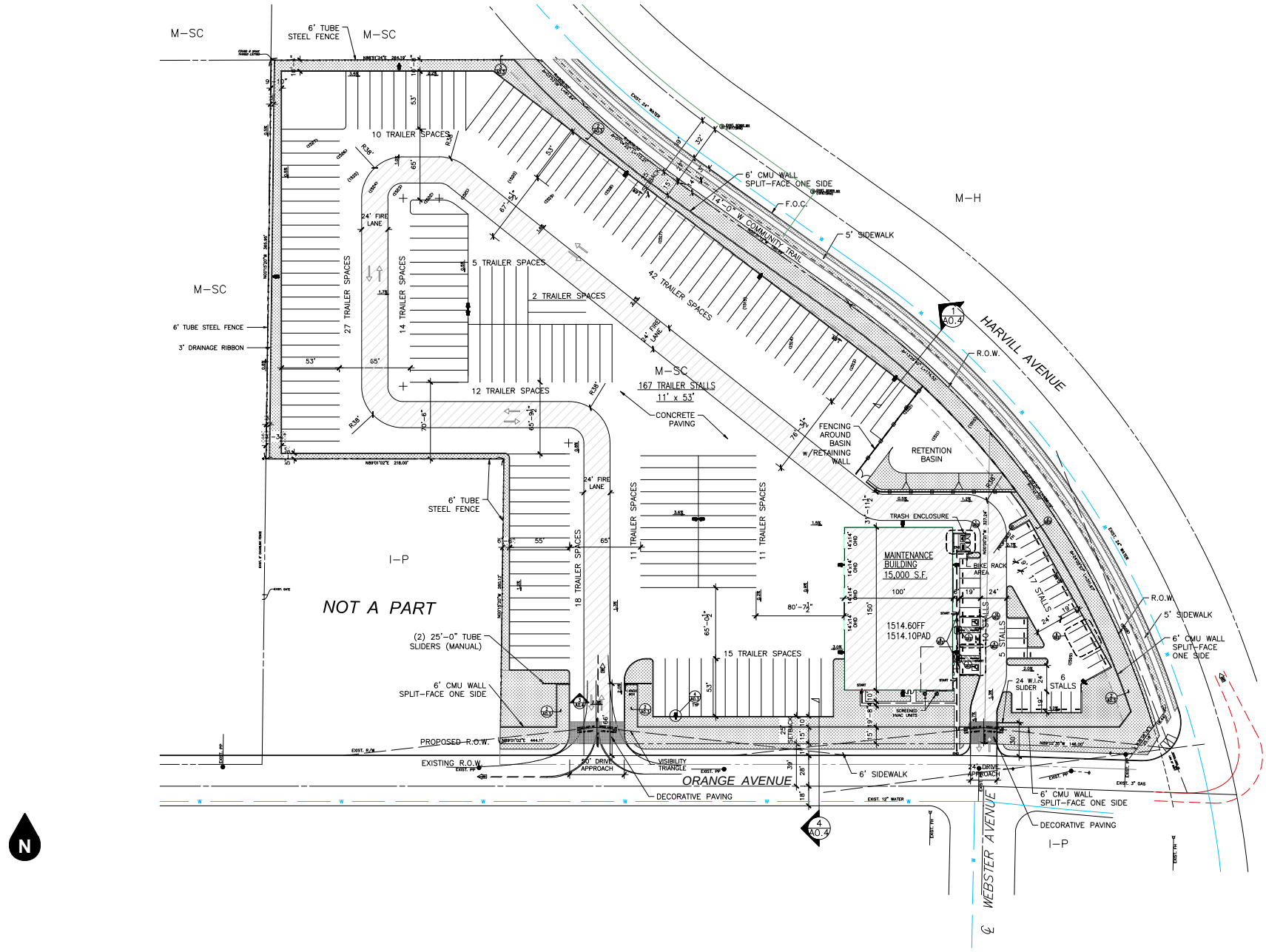


Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

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 Raleigh 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. 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.

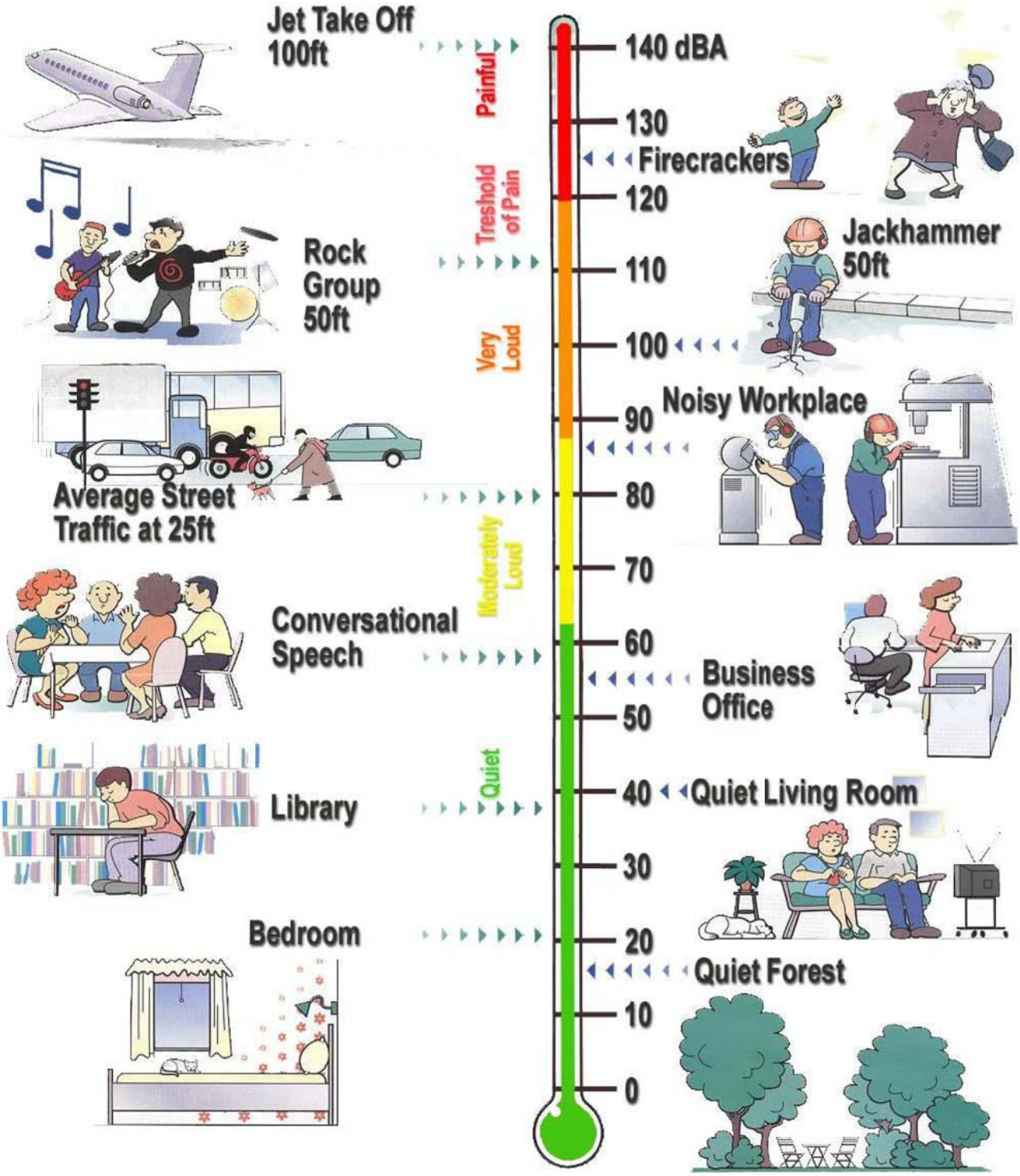
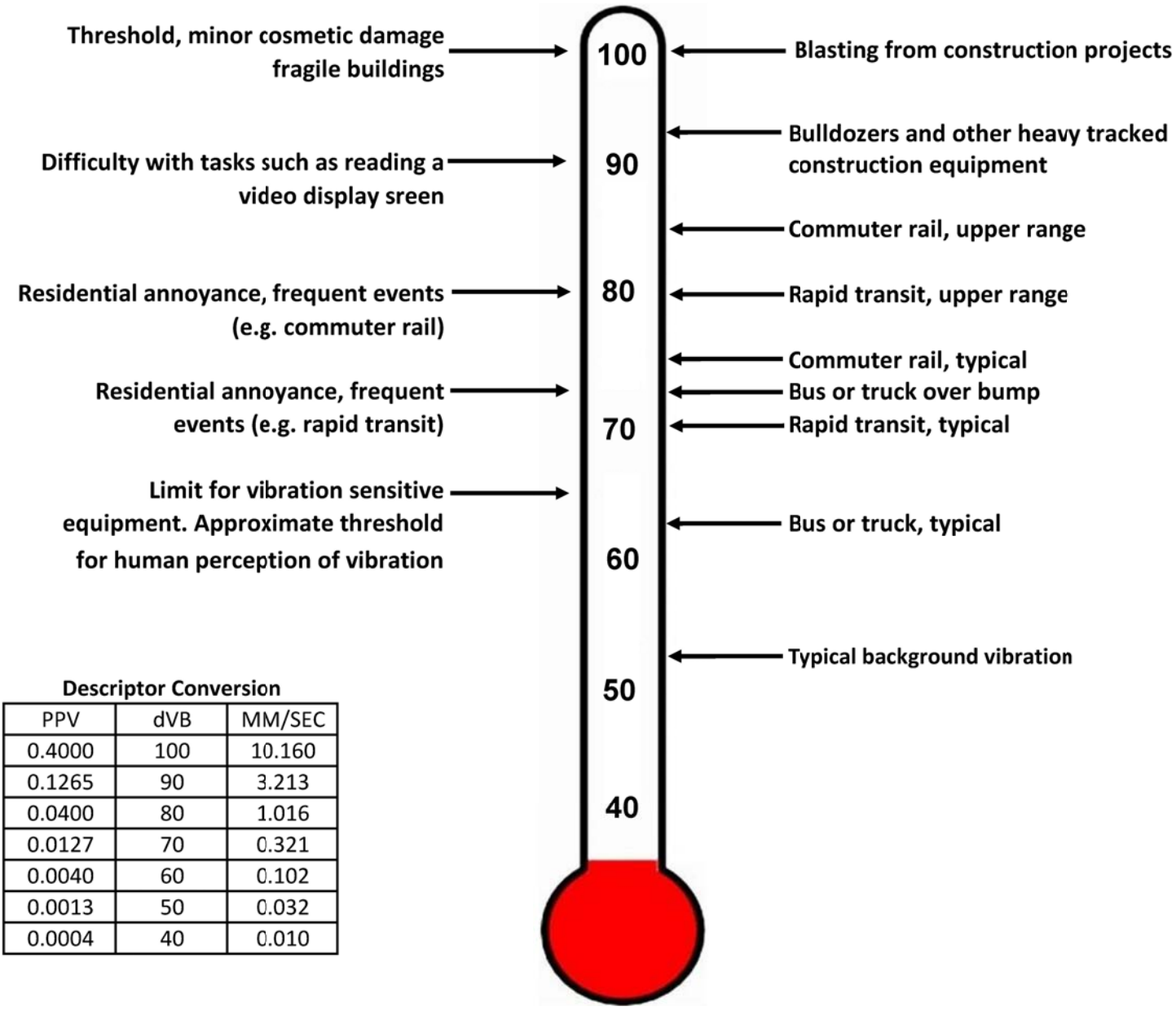


Figure 3
Weighted Sound Levels and Human Response

Source: Bruel & Kjaer 2001



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

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by vacant land to the north, Harvill Avenue to the east, Orange Avenue to the south, and vacant land to the west.

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. Sensitive land uses that may be affected by project noise include the existing single-family detached residential property lines located approximately 235 feet southwest, 275 feet south (across Orange Avenue), and 660 feet west of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section S1.4 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, three (3) 15-minute daytime noise measurements were taken between 2:52 PM and 4:12 PM on April27, 2020. In addition, one (1) long-term 24-hour noise measurement was also taken from April 27, 2020, to April 28, 2020. Field worksheets and noise measurement output data are included in Appendix C.

As shown on Figure 5, the noise measurements were taken near the single-family residential uses to the south of the project site (along Webster Avenue) (STNM1), near the single-family residential uses to the southwest of the project site (along Orange Avenue) (STNM2), near the single-family residential uses located to the west of the project site (along Orange Avenue between Geens Place and Tobacco Road) (STNM3), and near the single-family residential uses to the southwest of the project site (along Orange Avenue) (LTNM1). 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 measurement. Short-term ambient noise levels were measured between 49.5 and 58.4 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 47.3 to 62.5 dBA L_{eq}. The dominant noise source was vehicles traffic associated with the Interstate 215 Freeway, Harvill Avenue, Orange Avenue, and Webster Avenue.

Table 1
Short-Term Noise Measurement Summary (dBA)

Daytime Measurements[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
STNM1	2:52 PM	58.4	72.6	45.8	67.3	62.3	57.6	54.3
STNM2	3:23 PM	49.5	69.2	43.0	54.7	51.9	49.0	46.9
STNM3	3:57 PM	52.0	73.2	40.6	57.8	50.9	48.1	45.3

Notes:
(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.
(2) Noise measurements performed on April 27, 2020.

Table 2
Long-Term Noise Measurement Summary (dBA)

24-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	6:00 PM	57.3	81.3	41.5	66.2	60.2	55.4	51.9
1	6:00 PM	57.9	78.8	44.1	68.0	57.7	51.0	48.3
2	7:00 PM	52.7	78.1	42.9	58.3	52.7	50.2	48.3
3	8:00 PM	51.1	75.8	45.3	53.2	51.2	49.8	48.8
4	9:00 PM	59.2	80.1	43.5	69.6	54.3	50.4	48.5
5	10:00 PM	50.0	70.7	44.6	53.1	49.9	48.7	47.9
6	11:00 PM	47.6	58.8	42.5	51.6	49.6	48.2	47.1
7	12:00 AM	47.3	57.8	41.5	52.0	50.0	48.0	46.5
8	1:00 AM	48.9	64.9	42.2	53.6	50.8	48.8	47.3
9	2:00 AM	50.3	76.6	43.7	52.4	50.7	49.4	48.2
10	3:00 AM	51.3	68.6	45.6	56.0	53.9	52.0	50.2
11	4:00 AM	55.0	75.9	48.4	58.0	55.6	54.6	53.4
12	5:00 AM	57.1	75.1	51.6	62.0	58.7	57.5	56.2
13	6:00 AM	56.5	68.5	52.9	59.4	58.1	57.1	56.2
14	7:00 AM	55.9	78.9	50.2	59.8	56.3	54.3	53.2
15	8:00 AM	55.6	81.3	48.1	60.2	55.7	52.8	51.5
16	9:00 AM	55.8	79.3	44.8	63.1	57.6	52.1	50.2
17	10:00 AM	56.6	78.9	48.7	62.2	57.9	55.6	53.8
18	11:00 AM	56.9	76.8	48.1	65.5	57.8	55.2	53.3
19	12:00 PM	57.4	80.9	48.4	62.8	58.3	54.7	52.8
20	1:00 PM	58.0	77.4	47.3	65.6	60.3	57.0	54.9
21	2:00 PM	61.7	78.5	48.5	68.3	65.9	62.2	59.0
22	3:00 PM	62.5	77.3	47.0	69.1	66.6	63.4	59.5
23	4:00 PM	61.0	77.0	46.4	69.3	65.3	60.8	56.4
24	5:00 PM	61.9	77.3	51.3	70.4	66.7	61.0	57.9

Notes:

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

(2) Noise measurement performed from April 27, 2020 to April 28, 2020.

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

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 addition, the Levels of Environmental Noise identified five (5) dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA Ldn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

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.

STATE REGULATIONS

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. The County of Riverside has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 3).

California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

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?

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise: Construction noise sources are regulated within the County of Riverside Ordinance 847 which prohibits construction activities other than between the hours of 6:00 AM to 6:00 PM during the months of June through September and between the hours of 7:00 AM and 6:00 PM during the months of October through May.

Although construction activity may be exempt from the noise standards in the County's Code, CEQA requires that potential noise impacts still be evaluated for significance.

The County of Riverside has not adopted a numerical threshold that identifies what a substantial increase would be. For purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) criteria will be used to establish significance thresholds. 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 $L_{eq\ (8\text{-}hr)}$. In compliance with the County's Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Project Operational Noise (permanent): The proposed project has the potential to generate on-site and off-site noise. For on-site generated noise, Policy N 2.3 of the County of Riverside General Plan applies. This policy establishes that the project may not cause exterior noise levels at residential land uses to exceed 65 dBA Leq (10-minute) and interior noise levels to exceed 55 dBA Leq (10-minute) during the hours of 7:00 AM to 10:00 PM. Further, exterior noise levels may not exceed 45 dBA Leq (10-minute) and interior noise levels may not exceed 40 dBA Leq (10-minute) during the hours of 10:00 PM to 7:00 AM (see Table 4).

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the County's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

b) Generate excessive groundborne vibration or groundborne noise levels?

The County currently does not have any adopted standards, guidelines, or thresholds relative to ground-borne vibration. Ground-borne noise refers to the noise generated by ground-borne vibration. 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 California Department of Transportation (Caltrans) are utilized to assess impacts due to ground-borne vibration.

Caltrans has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. As shown in Table 5, the threshold at which there is a risk to "architectural" damage to historic and some older buildings is a peak particle velocity (PPV) of 0.25 in/sec, at older residential structures a PPV of 0.3 in/sec, and at new residential structures and modern commercial/industrial buildings a PPV of 0.5 in/sec. In addition, Caltrans has adopted standards associated with human annoyance for groundborne vibration impacts. As shown in Table 6, vibration is considered to be strongly perceptible at a PPV of 0.1 in/sec.

Therefore, impacts would be significant if construction activities result in groundborne vibration of 0.3 PPV or higher at residential structures and/or a PPV of 0.5 or higher at commercial structures.

LOCAL REGULATIONS

County of Riverside General Plan

The County of Riverside has adopted a modified version of the State of California Noise Land Use Compatibility Matrix (see Table 3). This Matrix establishes standards for outdoor noise levels that are normally acceptable, conditionally acceptable, normally unacceptable and clearly unacceptable for a variety of land uses. For industrial uses noise levels of up to 75 dBA CNEL are "normally acceptable" and levels up to 80 dBA CNEL are "conditionally acceptable". These standards apply to the proposed project itself. Additional County of Riverside General Plan Policies which apply to the proposed project are presented below.

Policy N 1.1: Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

Policy N 1.5: Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

Policy N 1.6: Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise sensitive uses.

Policy N 2.3: Mitigate exterior and interior noises to the levels listed in Table 4, to the extent feasible, for stationary sources.

Policy N 4.1: Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:

a. 45 dBA-10-minute L_{eq} between 10:00 PM and 7:00 AM [nighttime standard].
b. 65 dBA-10-minute L_{eq} between 7:00 AM and 10:00 PM [daytime standard].

Policy N 4.3: Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented.

Policy N 4.5: Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce

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

noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities.

Policy N 4.8: Require that the parking structures, terminals, and loading docks of commercial or industrial land uses be designed to minimize the potential noise impacts of vehicles on the site as well as on adjacent land uses.

Policy N 9.3: Require development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures.

Policy N 8.6: Require that all future exterior noise forecasts use Level of Service C and be based on designed road capacity or 20-year projection of development (whichever is less) for future noise forecasts.

Policy N 13.1: Minimize the impacts of construction noise on adjacent uses within acceptable practices.

Policy N 13.2: Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

Policy N 13.3: Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

a. Temporary noise attenuation fences;
b. Preferential location of equipment; and
c. Use of current noise suppression technology and equipment.

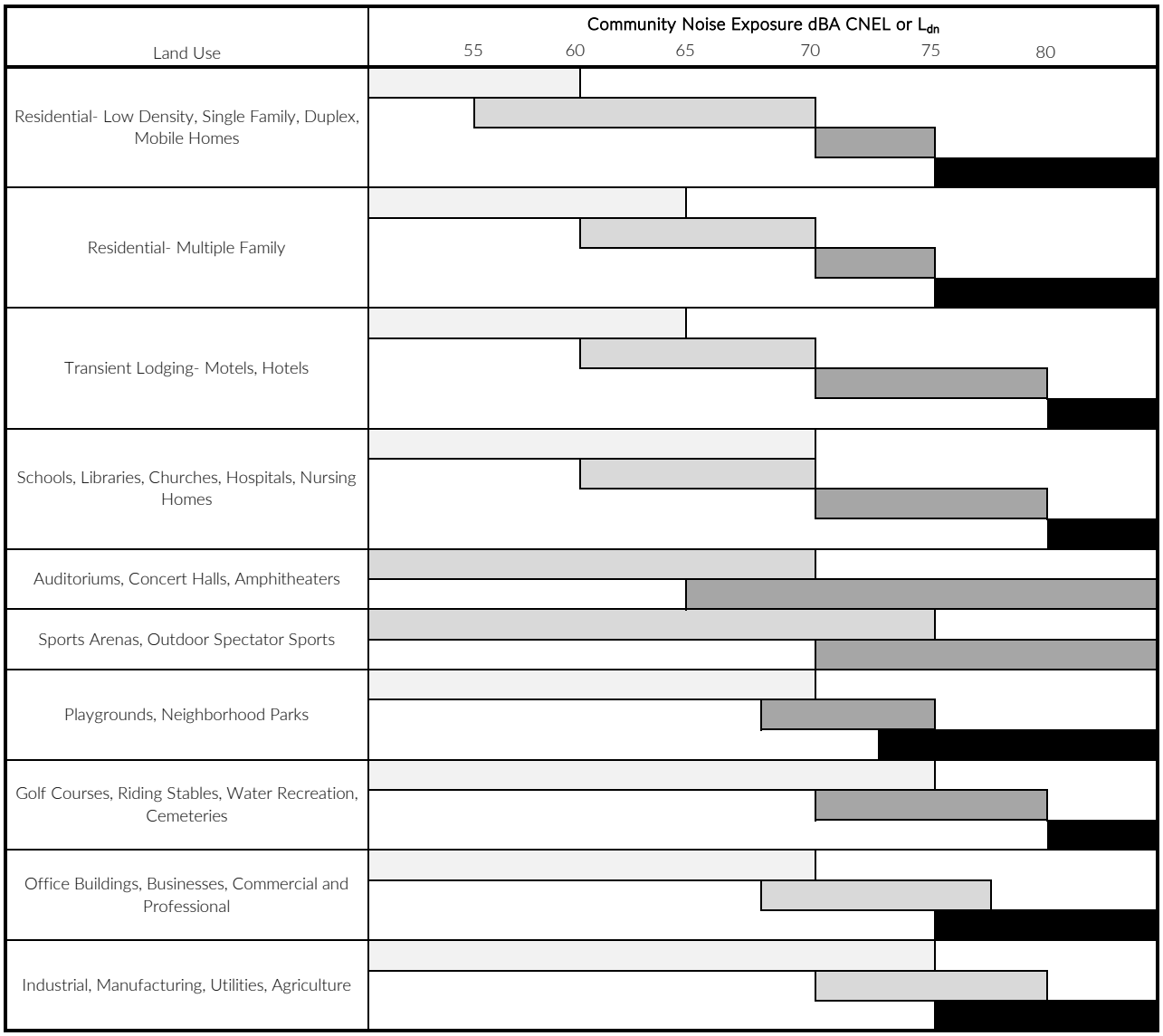
Policy N 13.4: Require that all construction equipment utilizes noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

Policy N 16.2: Consider the following land uses sensitive to vibration: hospitals, residential areas, concert halls, libraries, sensitive research operations, schools, and offices.

County of Riverside Code

Ordinance 847 exempts construction noise from County noise standards as long as long as it is limited to the hours of 6:00 AM to 6:00 PM during the months of June through September and between the hours of 7:00 AM and 6:00 PM during the months of October through May (Sec 2.i.1,2).

Table 3
County of Riverside Land Use Compatibility for Community Noise Exposure



	Normally Acceptable:	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable:	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.
	Normally Unacceptable:	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.
	Clearly Unacceptable:	New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Notes:

Source: County of Riverside General Plan Noise Element Table N-1, 2015.

Table 4
County of Riverside Stationary Source Land Use Noise Standards

Residential Land Use	Interior Standards	Exterior Standards
10:00 PM to 7:00 AM	40 Leq (10 minute)	45 Leq (10 minute)
7:00 AM to 10:00 PM	55 Leq (10 minute)	65 Leq (10 minute)

Notes:

(1) Source: County of Riverside General Plan Noise Element.

(2) These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.

Table 5
Guideline Vibration Damage Potential Threshold Criteria

Structure Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, anceint monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 19, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 6
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 20, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

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

CONSTRUCTION NOISE MODELING

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 CalEEMod modeling in the Air Quality, Global Climate Change, HRA, and Energy Impact Analysis prepared for the proposed project (Ganddini Group, Inc., 2022). For construction noise 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. Construction noise worksheets are provided in Appendix D.

FEDERAL HIGHWAY ADMINISTRATION (FHWA) TRAFFIC NOISE PREDICTION MODEL

Existing, existing plus project and future traffic noise levels were modeled utilizing a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108. The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emissions Levels.[2] Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification (i.e., collector, secondary, major or arterial), the roadway active width (i.e., distance between the center of the outermost travel lanes on each side of the roadway), travel speed, truck mix (i.e., percentage of automobiles, medium trucks, and heavy trucks in the traffic volume), roadway grade and site conditions (hard or soft ground surface relating to the absorption of the ground, pavement, or landscaping). Research conducted by Caltrans identifies that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model.[3] Therefore, surfaces adjacent to all modeled roadways were assumed to have a "soft site". Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Roadway parameters utilized in the noise model include location, traffic volume, speed and vehicle mix (autos, medium trucks, and heavy trucks). It is important to evaluate potential impacts of the noisiest possible future conditions. These conditions occur when the maximum number of vehicles pass at the greatest speed. This scenario usually corresponds to Level of Service C (LOS C) Conditions, or about 75% of buildout capacity. The County of Riverside General Plan Mead Valley Area Plan identifies Harvill Avenue as a Major (118-foot right-of-way) roadway. Per the County of Riverside Industrial Hygiene Guidelines for Determining and Mitigating Traffic Noise Impacts to Residential Structures and County of Riverside General Plan, Chapter 4, Figure C-3 "Link Volume Capacities/Level of Service for Riverside County Roadways" revised March 2001, future buildout noise levels associated with these roadways were modeled using average daily traffic volume Level of Service "C" design capacities (also known as future build-out daily traffic volumes). Harvill Avenue is expected to accommodate up to 27,300 vehicles per day at Level of Service C. The D/E/N splits for use in acoustical studies published by the Riverside County Department of Industrial Hygiene were utilized for noise modeling.

[2] California Department of Transportation Environmental Program, Office of Environmental Engineering. Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction. September 1995. TAN 95-03.

[3] California Department of Transportation. Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report. June 1995. FHWA/CA/TL-95/23.

Existing average daily traffic volumes were calculated utilizing the traffic counts provided by the County of Riverside Transportation Department (2020) for Harvill Avenue and the traffic counts provided in Appendix B of the Harvill Trailer Storage Yard Focused Traffic Analysis prepared for the project by Ganddini Group, Inc. (January 2022) for Orange Avenue.[4] Project average daily traffic volumes and vehicle mix were obtained from the project's trip generation and vehicle miles traveled screening analysis (Ganddini Group 2021). Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

SOUNDPLAN NOISE MODEL

The SoundPLAN acoustical modeling software was utilized to model project operational worst-case stationary noise impacts from the proposed project to adjacent sensitive uses (e.g., residences). SoundPLAN is capable of evaluating stationary noise sources (e.g., parking lots, drive-thru menus, carwash equipment, vacuums, etc.) and much more. 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.

Peak hour operational noise levels were modeled utilizing representative sound levels in the SoundPLAN model. Modeled noise sources include vehicle movement, parking lot noise, and HVAC equipment. All noise sources were modeled to be in full operation for an entire hour. This is a conservative modeling effort, given that in actuality, several of the noise sources are not in operation continuously for an entire hour

Parking Lot Noise

Parking lot noise was calculated using SoundPLAN methodology. Specifically, the traffic volume of the parking lot is entered with the number of moves per parking, the hour and the number of parking bays. The user defines whether the parking lots are for automobiles, motorcycles, or trucks, and the emission level of a parking lot is automatically adjusted accordingly. The values for the number of parking moves for each time slice is the number of parking moves per reference unit (most often per parking bay), averaged for the hour[5].

SoundPLAN utilizes parking lot noise emission levels from the 6th revised edition of the parking lot study "Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Story Car Parks and Underground Car Parks" published by the Bavarian Landesamt für Umwelt. The study provides calculation methods to determine the emissions of parking lots.

The parking lot emission table documents the reference level (Lw, ref) from the parking lot study.

Lw, ref = Lw0 + KPA + KI + KD + KStrO + 10 log(B) [dB(A)]

With the following parameters:

Lw0 = Basic sound power, sound power level of one motion / per hour on P+R areas = 63 dB(A)
KPA = Surcharge parking lot type
KI = Surcharge for impulse character
KD = Surcharge for the traffic passaging and searching for parking bays in the driving lanes 2,5 * lg (f * B - 9)
f = Parking bays per unit of the reference value

[4] County of Riverside Transportation Department Traffic Counts 2020 obtained at https://rctlma.org/Portals/7/documents/Traffic/2020_TRANS_WEB_COUNTS.PDF?ver=2020-01-23-083031-480. Accessed November 29, 2021.

[5] SoundPLAN Essential 4.0 Manual. SoundPLAN International, LLC. May 2016.

B = Reference value
KStrO = Surcharge for the road surface
B = Reference value

Refrigerated Trucks

Refrigerated truck parking was modeled as an area source with a sound power level of 98 dBA Leq.[6]

Mechanical Equipment (HVAC Units) Noise

A noise reference level of 67.7 dBA at 3 feet (sound power level of 78.7 dB) was utilized to represent rooftop 5 Ton Carrier HVAC units.[7] A rooftop HVAC plan is not available at the time of this analysis so the exact location and number of units per building were estimated. A total of 8 rooftop units were modeled on the proposed rooftops. The noise source height for each HVAC unit was assumed at 1 meter above the roof top. Roof top is assumed to be approximately 6 meters (~18.3 feet) above grade.

[6] SoundPLAN Essentials (as updated 8/25/2020) noise reference library for a truck cooling unit.

[7] MD Acoustics, LLC Noise Measurement Data for RTU –Carrier 50TFQ0006 and car alarm.

6. IMPACT ANALYSIS

This impact discussion analyzes the potential for noise and/or groundborne vibration impacts to cause the exposure of a person to, or generation of, noise levels in excess of established County of Riverside standards related to construction, operation, and transportation noise related impacts to, or from, the proposed project.

IMPACTS RELATED TO CONSTRUCTION NOISE

The existing single-family detached residential dwelling units located to the southwest, south, and west of the project site may be affected by short-term noise impacts associated with construction noise. 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 phases will include site preparation, grading, building construction, paving and architectural coating. Typical noise levels associated with a variety of construction equipment compiled by the U.S. Department of Transportation is presented in Table 7. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings.

Noise levels at nearby sensitive receptors due to project construction noise were calculated 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 proposed construction activity. Construction noise levels were calculated for each phase. Anticipated noise levels during each construction phase are presented in Table 8. Worksheets for each phase are included as Appendix D.

A comparison of existing noise levels and existing plus project construction noise levels is presented in Table 8. STNM1 was chosen to represent noise levels at the property line of the single-family residential uses to the south, STNM2 was chosen to represent noise levels at the property line of the single-family residential uses to the southwest of the project site, STNM3 was chosen to represent noise levels at the property line of the single-family residential uses to the west of the project site, STNM1 was chosen to represent the industrial property lines of the properties to the east of the project site, and STNM1 was chosen to represent the commercial property lines of properties to the southeast of the project site.

Modeled unmitigated construction noise levels when combined with existing measured noise levels are expected to reach 67.3 dBA L_{eq} at the nearest residential property lines to the south, 68.2 dBA L_{eq} at the nearest residential property lines to the southwest, 62.7 dBA L_{eq} at the nearest residential property lines to the west, 71.1 dBA L_{eq} at the nearest industrial property lines to the east, and up to 63.6 dBA L_{eq} at the nearest commercial property lines to the southeast of the project site.

As discussed earlier, construction noise sources are regulated within the County of Riverside Ordinance 847, which prohibits construction activities other than between the hours of 6:00 AM to 6:00 PM during the months of June through September and between the hours of 7:00 AM and 6:00 PM during the months of October through May.

As stated previously per 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. Therefore, project construction would not be anticipated to exceed the FTA thresholds for residential uses. Further, with compliance with the County's Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours. Construction noise impacts are considered less than significant. Although

mitigation is not required, impacts can be minimized with adherence to the County of Riverside Ordinance 847 and implementation of the recommended best management practices presented in Section 7 of this report.

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

During operation the proposed project is expected to generate approximately 396 average daily trips with 24 trips during the AM peak-hour and 26 trips during the PM peak-hour. A worst-case project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. As project trip distribution is not provided in the project specific trip generation and vehicle miles traveled screening analysis (Ganddini Group 2021), to show a worst-case analysis, it was assumed that all project generated vehicle trips would travel along Orange Avenue and that fifty percent would travel north on Harvill Avenue and fifty percent would travel south on Harvill Avenue from Orange Avenue. Traffic noise levels were calculated at the right of way 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 levels are shown for comparative purposes only to show the difference in with and without project conditions and not necessarily existing and existing plus project traffic noise levels. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 9. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions and is demonstrated in Table 10.

Existing Year (With Project): This scenario refers to existing year plus project traffic noise conditions and is demonstrated in Table 10.

As shown in Table 10, modeled Existing traffic noise levels range between 45.2-72 dBA CNEL at the right-of-way of each modeled roadway segment; and the modeled Existing Plus Project traffic noise levels range between 54-72 dBA CNEL at the right-of-way of each modeled roadway segment.

For purposes of this project, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the County's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

As shown in Table 10, project generated vehicle traffic will result in an increase of 9.1 dBA CNEL along the right-of-way of Orange Avenue between the western project driveway and Harvill Avenue. Existing noise levels along the right-of-way at this area do not currently exceed what considered "normally acceptable" for residential land uses (60 dBA CNEL). Further, project generated traffic in will not cause ambient noise levels at this area to exceed 60 dBA CNEL.

Project generated vehicle traffic will result in an increase of 0.4 dBA CNEL along the right-of-way of Harvill Avenue north and south of Orange Avenue. Increases in ambient noise levels due to project generated vehicle traffic will be less than significant. No mitigation is required.

Transportation Noise Impacts to the Proposed Project

Per the County of Riverside General Plan, noise levels of up to 75 dBA CNEL are "normally acceptable" and levels up to 80 dBA CNEL are "conditionally acceptable" for industrial uses (see Table 3).

Future buildout traffic noise levels from Harvill Avenue, modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108, could reach up to approximately 73.8 dBA CNEL at the nearest proposed industrial building to Harvill Avenue, approximately 130 feet southwest of the centerline of the roadway and would fall within the County's normally acceptable exterior noise standards for commercial uses. Impacts related to future traffic noise impacts to the proposed project would be less than significant. No mitigation is required.

Noise Impacts to Off-Site Receptors Due to On-Site Operational Noise

As discussed previously, sensitive land uses that may be affected by project noise include the existing single-family detached residential dwelling units located approximately 235 feet southwest, 275 feet south, and 660 feet west of the project site.

The SoundPLAN noise model was utilized to estimate project peak hour operational noise at sensitive receptors in order to determine if it is likely to exceed the County's noise thresholds at sensitive receptors. A description of each noise source and model parameters are discussed in Section 5 of this report. As shown on Figures 6 and 7, peak hour project operation is expected to range between 39 and 45 dBA L_{eq} at the nearest sensitive receptors and is not expected to exceed the County's exterior daytime or nighttime noise thresholds of 65 dBA L_{eq} and 45 dBA L_{eq}, respectively. Project operational noise levels would be considered less than significant. No mitigation is required.

Groundborne Vibration Impacts

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. As shown in Table 11, a vibratory roller could generate up to 0.21 PPV at a distance of 25 feet; and operation of a large bulldozer (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 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.

Architectural Damage

Vibration generated by construction activity generally has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile. (California Department of Transportation, 2020)

Table 5 identifies a PPV level of 0.3 in/sec as the threshold at which there is a risk to "architectural" damage to older residential buildings and a PPV level of 0.5 in/sec to commercial buildings.

The nearest off-site buildings are the single-family residential dwelling units located approximately 350 feet to the southwest of the project site property line. At 350 feet, use of a vibratory roller would be expected to generate a PPV of 0.004 in/sec and a bulldozer would be expected to generate a PPV of 0.002 in/sec.

Therefore, temporary vibration levels associated with project construction would not cause architectural damage to the nearest residential receptors to the southwest. Impacts from vibration generated damage would be less than significant. Vibration worksheets are provided in Appendix G.

Annoyance to Persons

The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping, or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential. (California Department of Transportation, 2020).

As shown in Table 6, vibration becomes strongly perceptible to sensitive receptors at a level of 0.1 in/sec PPV. A vibratory roller could generate a PPV of up to 0.1 in/sec at a distance of 41 feet and a large bulldozer at a distance of 24 feet.

The closest buildings to the project site are the residential dwelling units located 350 feet to the southwest of the project property line. Impacts from vibration related annoyance would be less than significant. Vibration worksheets are provided in Appendix G.

Table 7 (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 7 (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 8
Construction Noise Levels (dBA L_{eq})

Phase	Receptor Location	Existing Ambient Noise Levels (dBA Leq)[1]	Construction Noise Levels (dBA Leq)[2]	Combined Noise Levels (dBA Leq)	Increase (dB)
Site Preparation	Residential to South	58.4	62	63.6	5.2
	Residential to Southwest	49.5	63.4	63.6	14.1
	Residential to West	52	57.6	58.7	6.7
	Industrial to East	58.4	66.1	66.8	8.4
	Commercial to Southeast	58.4	57.3	60.9	2.5
Grading	Residential to South	58.4	66.7	67.3	8.9
	Residential to Southwest	49.5	68.1	68.2	18.7
	Residential to West	52	62.3	62.7	10.7
	Industrial to East	58.4	70.9	71.1	12.7
	Commercial to Southeast	58.4	62.1	63.6	5.2
Building Construction	Residential to South	58.4	64.5	65.5	7.1
	Residential to Southwest	49.5	65.9	66.0	16.5
	Residential to West	52	60.1	60.7	8.7
	Industrial to East	58.4	68.6	69.0	10.6
	Commercial to Southeast	58.4	59.9	62.2	3.8
Paving	Residential to South	58.4	61.8	63.4	5.0
	Residential to Southwest	49.5	63.2	63.4	13.9
	Residential to West	52	57.4	58.5	6.5
	Industrial to East	58.4	65.9	66.6	8.2
	Commercial to Southeast	58.4	57.1	60.8	2.4
Architectural Coating	Residential to South	58.4	54.4	59.9	1.5
	Residential to Southwest	49.5	55.8	56.7	7.2
	Residential to West	52	50.0	54.1	2.1
	Industrial to East	58.4	58.5	61.5	3.1
	Commercial to Southeast	58.4	49.8	59.0	0.6

Notes:

(1) Per measured existing ambient noise levels. STNM1 was used for receptors to the south, east, and southeast, STNM2 for receptors to the southwest, and STNM3 for receptors to the west.

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

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[2]		
Orange Avenue	Western Project Driveway to Harvill Avenue	675	1,071	25	Hard
Harvill Avenue	North of Orange Avenue	6,303	6,501	50	Hard
	South of Orange Avenue	7,058	7,256	50	Hard

Vehicle Distribution (Light Mix)[3]			
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)[3]			
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 average daily traffic volumes for Harvilll Avenue were obtained from the traffic counts provided by the County of Riverside Transportation Department (2020) (https://rctlma.org/Portals/7/documents/Traffic/2020_TRANS_WEB_COUNTS.PDF?ver=2020-01-23-083031-480). Existing average daily traffic volumes for Orange Avenue were obtained from the traffic counts provided in Appendix B of the Harvill Trailer Storage Yard Focused Traffic Analysis prepared for the project by Ganddini Group, In.c (January 2022). Project average daily traffic volumes and vehicle mix were obtained from the Harvill Trailer Storage Yard Project Trip Generation & Vehicle Miles Traveled Screening Analysis, Ganddini Group, Inc. (January 2022).

(2) As project trip distribution was not provided in the Focused Traffic Analysir nor the Trip Generation & VMT Screening Analysis prepared for the proposed project, it was assumed that all project generated trips would travel along Orange Avenue and that fifty-percent of project generated vehicle trips would travel north on Harvill Avenue and fifty-percent of project generated vehicle trips would travel south on Harvill Avenue.

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

Table 10
Change in Existing Noise Levels Along Roadways as a Result of Project (dBA CNEL)

Roadway	Segment	Distance from roadway centerline to nearest sensitive receptor[2]	Modeled Noise Levels (dBA CNEL)[1]				
			Existing Without Project at right-of-way	Existing Plus Project at right-of-way	Change in Noise Level	Exceeds Standards[3]	Increase of 5 dB or More?
Orange Avenue	Western Project Dwy to Harvill Ave	260	45.2	54.4	9.1	No	Yes
Harvill Avenue	North of Orange Avenue	50	71.6	72.0	0.4	Yes	No
	South of Orange Avenue	290	64.5	64.8	0.4	Yes	No

Notes:

(1) Exterior noise levels calculated 5 feet above pad elevation, perpendicular to subject roadway.

(2) Distance calculated from the centerline of the analyzed road segment to the property line of the nearest sensitive receptor. For Orange Avenue, as the project generated vehicle trips would only travel along Orange Avenue from Harvill Avenue to the most western project driveway, the distance was calculated from the centerline of the roadway at the most western project driveway to the property line of the nearest sensitive receptor.

(3) Per the County of Riverside normally acceptable standard for single-family detached residential dwelling units (see Table 3).

Table 11
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

Figure 6
Operational Noise Levels (Leq)

Figure 7
Operational Noise Level Contours (Leq)

7. BEST MANAGEMENT PRACTICES

In addition to adherence to the County of Riverside Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

2. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Equipment shall be shut off and not left to idle when not in use.

4. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded, and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

8. REFERENCES

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APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Construction Noise Modeling
Appendix E Project Generated Trips FHWA Worksheets
Appendix F SoundPLAN Input and Output
Appendix G Vibration Worksheets

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)
LOS C	Level of Service C
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}	L_{max} 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. L_{min} 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: Harvill Trailer Storage Yard, Orange Ave & Harvill Ave, City of Perris. **Date:** April 27, 2021

Project #: 19365

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

Nearest Address or Cross Street: 21063 Webster Avenue, Perris , California

Site Description (Type of Existing Land Use and any other notable features): Project site: Mostly vacant w/ shrubs & concrete pad. Harvill Ave to east, Orange Ave to south, & vacant land to north & west. Noise Measurement Site: Vacant land to north, Webster Ave to east, & residential w/ commercial use to south and west.

Weather: Patchy sunshine, white clouds overhead, dark clouds SE. **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 9 mph **Humidity:** 39% **Terrain:** Flat

Start Time: 2:52 PM **End Time:** 3:07 PM **Run Time:**

Leq: 58.4 dB

Lmax 72.6 dB

L2 67.3 dB

L8 62.3 dB

L25 57.6 dB

L50 54.3 dB

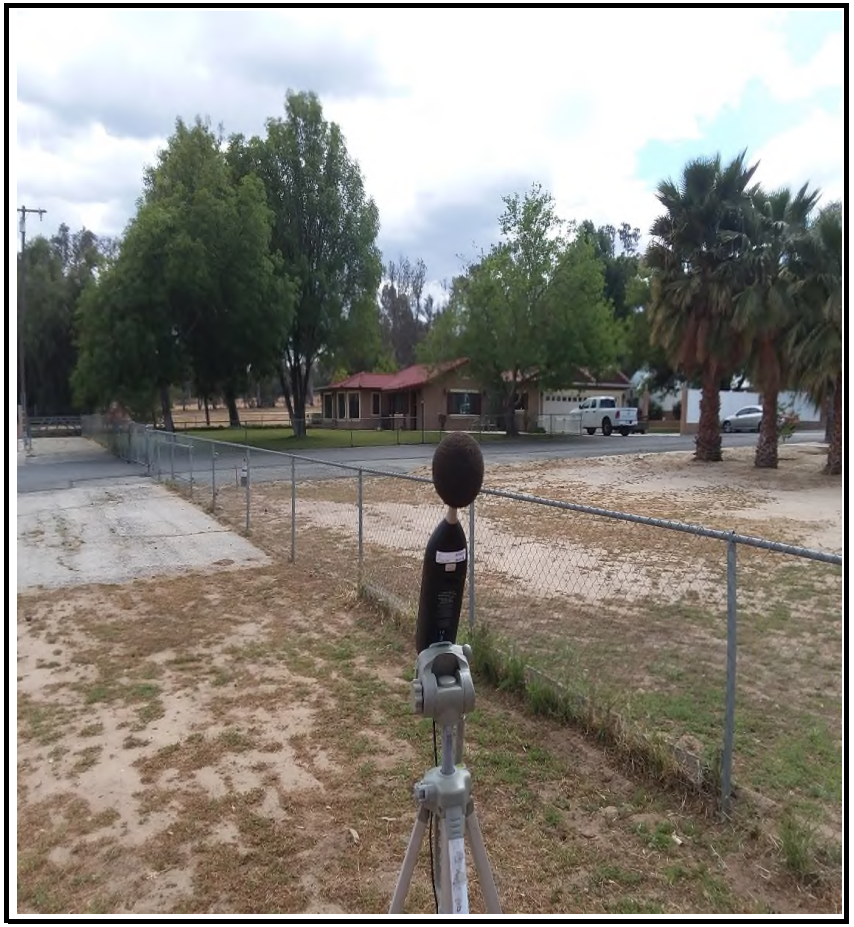
Primary Noise Source: Traffic ambiance from vehicles on the 215 Fwy, Harvill Ave & Orange Ave. 12 vehicles passed microphone along Webster Ave during 15-min sample.

Secondary Noise Sources: Bird song, tree leaves rustling in gentle breeze, occasional distant overhead military jet & propeller aircraft (March ARB to N). Some residential ambiance.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	4/27/2021		

Noise Measurement
Field Data

PHOTOS:



STNM1 looking SW across front yard of residence 21063 Webster Avenue , Perris.

STNM1 looking N along Webster Avenue, towards Orange Avenue intersection.

Summary					
File Name on Meter	LxT_Data.023				
File Name on PC	SLM_0001152_LxT_Data_023.00.ldbin				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM1 33°48'54.34"N 117°14'38.26"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	19365 Harvill Trailer Storage Yard, City of Perris				
Measurement					
Start	2021-04-27 14:52:59				
Stop	2021-04-27 15:07:59				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre Calibration	2021-04-27 14:50:59				
Post Calibration	None				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamp	PRMLxT1				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Freq. Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	144.1 dB				
Results					
LAeq	58.4				
LAE	87.9				
EA	68.803 µPa²h				
EA8	2.202 mPa²h				
EA40	11.009 mPa²h				
LZpeak (max)	2021-04-27 15:05:17	116.2 dB			
LASmax	2021-04-27 15:04:37	72.6 dB			
LASmin	2021-04-27 15:00:51	45.8 dB			
SEA	-99.94 dB				
LAFTM5	63.4 dB		Statistics		
Corrected dBA	58.5 dBA		**LAI2.00**	67.3 dB	
			LAI8.00	62.3 dB	
LCeq	71.8 dB		**LAI25.00**	57.6 dB	
LAeq	58.4 dB		**LAI50.00**	54.3 dB	
LCeq - LAeq	13.4 dB		**LAI66.60**	52.9 dB	
LAleq	60.5 dB		**LAI90.00**	50.0 dB	
LAeq	58.4 dB				
LAleq - LAeq	2.1 dB				
# Overloads	0				

Noise Measurement
Field Data

Project Name: Harvill Trailer Storage Yard, Orange Ave & Harvill Ave, City of Perris. **Date:** April 27, 2021

Project #: 19365

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

Nearest Address or Cross Street: 23815 Orange Avenue, Perris , California

Site Description (Type of Existing Land Use and any other notable features): Project site: Mostly vacant w/ shrubs & concrete pad. Harvill Ave to east, Orange Ave to south, & vacant land to north & west. Noise Measurement Site: Orange Ave to north with remnants of a previous residential use further north, residential to south/southwest w/ livestock (horses), & vacant land to southeast.

Weather: Patchy sunshine, white clouds overhead, dark clouds SE. **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 9 mph **Humidity:** 39% **Terrain:** Flat

Start Time: 3:23 PM **End Time:** 3:38 PM **Run Time:**

Leq: 49.5 dB

Lmax 69.2 dB

L2 54.7 dB

L8 51.9 dB

L25 49.0 dB

L50 46.9 dB

Primary Noise Source: Traffic ambiance from vehicles on the 215 Fwy & Harvill Ave. No vehicles passed microphone traveling along Orange Ave during 15-min measurement.

Secondary Noise Sources: Bird song, tree leaves rustling in gentle breeze, occasional distant overhead military jet & propeller aircraft (March ARB to N). Some residential ambiance.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	4/27/2021		

Noise Measurement
Field Data

PHOTOS:

STNM2 looking SW across corrals & buildings, towards residence 23815 Orange Ave, Perris.

STNM2 looking NE across Orange Avenue, across burnt out remains of residence 23896 Orange Avenue & towards project site area.

Summary	
File Name on Meter	LxT_Data.024
File Name on PC	SLM_0001152_LxT_Data_024.00.ldbin
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM2 33°48'56.70"N 117°14'46.11"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	19365 Harvill Trailer Storage Yard, City of Perris

Measurement	
Start	2021-04-27 15:23:37
Stop	2021-04-27 15:38:37
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2021-04-27 15:23:10
Post Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	144.0 dB

Results			
LAeq	49.5		
LAE	79.0		
EA	8.831	µPa²h	
EA8	282.608	µPa²h	
EA40	1.413	mPa²h	
LZpeak (max)	2021-04-27 15:28:50	104.6	dB
LASmax	2021-04-27 15:26:15	69.2	dB
LASmin	2021-04-27 15:36:44	43.0	dB
SEA	-99.94	dB	
LAFTM5	53.5	dB	
LCeq	66.0	dB	
LAeq	49.5	dB	
LCeq - LAeq	16.5	dB	
LAleq	51.9	dB	
LAeq	49.5	dB	
LAleq - LAeq	2.4	dB	
# Overloads	0		

Statistics		
LAI2.00	54.7	dB
LAI8.00	51.9	dB
LAI25.00	49.0	dB
LAI50.00	46.9	dB
LAI66.60	46.0	dB
LAI90.00	44.9	dB

Noise Measurement
Field Data

Project Name: Harvill Trailer Storage Yard, Orange Ave & Harvill Ave, City of Perris. **Date:** April 27, 2021

Project #: 19365

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

Nearest Address or Cross Street: 23672 Orange Avenue, Perris , California

Site Description (Type of Existing Land Use and any other notable features): Project site: Mostly vacant w/ shrubs & concrete pad. Harvill Ave to east, Orange Ave to south, & vacant land to north & west. Noise Measurement Site: Orange Ave to south with residential further south & residential to north.

Weather: Patchy sunshine, white clouds overhead, dark clouds SE. **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 9 mph **Humidity:** 39% **Terrain:** Flat

Start Time: 3:57 PM **End Time:** 4:12 PM **Run Time:**

Leq: 52 dB
Lmax 73.2 dB
L2 57.8 dB
L8 50.9 dB
L25 48.1 dB
L50 45.3 dB

Primary Noise Source: Traffic ambiance from vehicles on the 215 Fwy & Harvill Ave. 3 vehicles passed microphone traveling along Orange Ave during 15-min measurement.

Secondary Noise Sources: Bird song, tree leaves rustling in gentle breeze, occasional distant overhead military jet & propeller aircraft (March ARB to N). Some residential ambiance.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	4/27/2021		

Noise Measurement
Field Data

PHOTOS:

STNM3 looking W up Orange Ave towards Tobacco Road intersection. Residence 23672 Orange Ave, Perris on the right .

STNM3 looking SW across Orange Ave towards residence 23745 Orange Ave, Perris.

Summary	
File Name on Meter	LxT_Data.025
File Name on PC	SLM_0001152_LxT_Data_025.00.ldbin
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM3 33°48'56.91"N 117°14'56.38"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	19365 Harvill Trailer Storage Yard, City of Perris

Measurement	
Start	2021-04-27 15:57:32
Stop	2021-04-27 16:12:32
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2021-04-27 15:56:47
Post Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	144.1 dB

Results			
LA_{eq}	52.0		
LAE	81.5		
EA	15.752	µPa²h	
EA8	504.078	µPa²h	
EA40	2.520	mPa²h	
$LZ_{peak\ (max)}$	2021-04-27 16:05:23	101.7	dB
LAS_{max}	2021-04-27 16:07:30	73.2	dB
LAS_{min}	2021-04-27 16:04:57	40.6	dB
SEA	-99.94	dB	

		Statistics	
LC_{eq}	60.9 dB	**LAI2.00**	57.8 dB
LA_{eq}	52.0 dB	**LAI8.00**	50.9 dB
LC_{eq} - LA_{eq}	8.9 dB	**LAI25.00**	48.1 dB
LAI_{eq}	55.4 dB	**LAI50.00**	45.3 dB
LA_{eq}	52.0 dB	**LAI66.60**	44.3 dB
LAI_{eq} - LA_{eq}	3.4 dB	**LAI90.00**	42.6 dB
# Overloads	0		

Noise Measurement
Field Data

Project Name: Harvill Trailer Storage Yard, Orange Ave & Harvill Ave, City of Perris. **Date:** April 27-28, 2021

Project #: 19365

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

Nearest Address or Cross Street: 23896 Orange Avenue, Perris , California

Site Description (Type of Existing Land Use and any other notable features): Project site: Mostly vacant w/ shrubs & concrete pad. Harvill Ave to east, Orange Ave to south, & vacant land to north & west. Noise Measurement Site: Orange Ave to south with residential further southwest, vacant land to west, & remnants of barn structure & concrete bldg pad to north/northwest.

Weather: Clouds clearing overnight Tues to clear skies on Wed. **Settings:** SLOW FAST

Temperature: 48-80deg F **Wind:** 1-15 mph **Humidity:** 35-60% **Terrain:** Flat

Start Time: 6:00 PM **End Time:** 6:00 PM **Run Time:**

Leq: 57.3 dB

Lmax 81.3 dB

L2 66.2 dB

L8 60.2 dB

L25 55.4 dB

L50 51.9 dB

Primary Noise Source: Traffic ambiance from vehicles on the 215 Fwy & Harvill Ave. Vehicles passing microphone traveling along Orange Ave during 24 hour measurement.

Secondary Noise Sources: Bird song, tree leaves rustling in gentle breeze, occasional distant overhead military jet & propeller aircraft (March ARB to N). Some residential ambiance.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT2	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	10/3/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	4/27/2021		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking SW inbetween two evergreen bushes, microphone on the right. Orange Avenue behind fence. Microphone located near SW corner of residence 23896 Orange Ave, Perris.

LTNM1 looking down from above, showing location of microphone relative to surrounding area.

Summary	
File Name on Meter	LxT_Data.026
File Name on PC	SLM_0001152_LxT_Data_026.00.ldbin
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	LTNM1 33°48'57.15"N 117°14'45.74"W
Job Description	24 hour noise measurement (24 x 1 hours)
Note	19365 Harvill Trailer Storage, City of Perris

Measurement	
Start	2021-04-27 18:00:00
Stop	2021-04-28 18:00:00
Duration	24:00:00.0
Run Time	24:00:00.0
Pause	00:00:00.0
Pre Calibration	2021-04-27 17:33:27
Post Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	144.0 dB

Results			
L_{Aeq}	57.3		
LAE	106.7		
EA	5.156	mPa²h	
EA8	1.719	mPa²h	
EA40	8.594	mPa²h	
$L_{Apeak\ (max)}$	2021-04-27 18:04:54	105.9	dB
L_{ASmax}	2021-04-28 08:43:31	81.3	dB
L_{ASmin}	2021-04-28 00:24:28	41.5	dB
SEA	-99.94	dB	

			Statistics	
L_{Ceq}	65.4	dB	**LAI2.00**	66.2 dB
L_{Aeq}	57.3	dB	**LAI8.00**	60.2 dB
L_{Ceq} - L_{Aeq}	8.1	dB	**LAI25.00**	55.4 dB
L_{AIeq}	62.7	dB	**LAI50.00**	51.9 dB
L_{Aeq}	57.3	dB	**LAI90.00**	46.7 dB
L_{AIeq} - L_{Aeq}	5.4	dB	**LAI99.00**	44.1 dB
# Overloads	0			

Record #	Date	Time	Run Duration	Run Time	LAeq	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2021-04-27	18:00:00	01:00:00.0	01:00:00.0	57.9	44.1	18:24:00	78.8	18:52:06	68.0	57.7	51.0	48.3	46.0	45.0
2	2021-04-27	19:00:00	01:00:00.0	01:00:00.0	52.7	42.9	19:33:26	78.1	19:12:41	58.3	52.7	50.2	48.3	45.8	44.3
3	2021-04-27	20:00:00	01:00:00.0	01:00:00.0	51.1	45.3	20:55:51	75.8	20:48:55	53.2	51.2	49.8	48.8	47.3	46.2
4	2021-04-27	21:00:00	01:00:00.0	01:00:00.0	59.2	43.5	21:06:29	80.1	21:22:37	69.6	54.3	50.4	48.5	46.1	44.1
5	2021-04-27	22:00:00	01:00:00.0	01:00:00.0	50.0	44.6	22:56:57	70.7	22:29:34	53.1	49.9	48.7	47.9	46.3	45.5
6	2021-04-27	23:00:00	01:00:00.0	01:00:00.0	47.6	42.5	23:54:22	58.8	23:21:52	51.6	49.6	48.2	47.1	44.8	43.0
7	2021-04-28	00:00:00	01:00:00.0	01:00:00.0	47.3	41.5	00:24:28	57.8	00:41:25	52.0	50.0	48.0	46.5	44.1	42.4
8	2021-04-28	01:00:00	01:00:00.0	01:00:00.0	48.9	42.2	01:25:19	64.9	01:20:53	53.6	50.8	48.8	47.3	44.6	42.9
9	2021-04-28	02:00:00	01:00:00.0	01:00:00.0	50.3	43.7	02:12:52	76.6	02:49:57	52.4	50.7	49.4	48.2	46.1	44.5
10	2021-04-28	03:00:00	01:00:00.0	01:00:00.0	51.3	45.6	03:17:21	68.6	03:32:52	56.0	53.9	52.0	50.2	47.5	46.2
11	2021-04-28	04:00:00	01:00:00.0	01:00:00.0	55.0	48.4	04:05:38	75.9	04:26:35	58.0	55.6	54.6	53.4	51.4	49.6
12	2021-04-28	05:00:00	01:00:00.0	01:00:00.0	57.1	51.6	05:08:30	75.1	05:32:53	62.0	58.7	57.5	56.2	53.8	52.5
13	2021-04-28	06:00:00	01:00:00.0	01:00:00.0	56.5	52.9	06:57:52	68.5	06:49:23	59.4	58.1	57.1	56.2	54.2	53.4
14	2021-04-28	07:00:00	01:00:00.0	01:00:00.0	55.9	50.2	07:50:25	78.9	07:26:47	59.8	56.3	54.3	53.2	51.8	51.0
15	2021-04-28	08:00:00	01:00:00.0	01:00:00.0	55.6	48.1	08:47:07	81.3	08:43:31	60.2	55.7	52.8	51.5	49.8	48.9
16	2021-04-28	09:00:00	01:00:00.0	01:00:00.0	55.8	44.8	09:54:33	79.3	09:44:46	63.1	57.6	52.1	50.2	48.2	45.9
17	2021-04-28	10:00:00	01:00:00.0	01:00:00.0	56.6	48.7	10:38:14	78.9	10:39:40	62.2	57.9	55.6	53.8	51.5	50.0
18	2021-04-28	11:00:00	01:00:00.0	01:00:00.0	56.9	48.1	11:32:31	76.8	11:55:00	65.5	57.8	55.2	53.3	50.8	49.1
19	2021-04-28	12:00:00	01:00:00.0	01:00:00.0	57.4	48.4	12:00:10	80.9	12:38:28	62.8	58.3	54.7	52.8	50.4	49.1
20	2021-04-28	13:00:00	01:00:00.0	01:00:00.0	58.0	47.3	13:53:13	77.4	13:43:59	65.6	60.3	57.0	54.9	50.8	48.7
21	2021-04-28	14:00:00	01:00:00.0	01:00:00.0	61.7	48.5	14:17:45	78.5	14:30:46	68.3	65.9	62.2	59.0	53.5	50.0
22	2021-04-28	15:00:00	01:00:00.0	01:00:00.0	62.5	47.0	15:47:00	77.3	15:26:05	69.1	66.6	63.4	59.5	51.2	47.9
23	2021-04-28	16:00:00	01:00:00.0	01:00:00.0	61.0	46.4	16:12:01	77.0	16:57:28	69.3	65.3	60.8	56.4	50.9	48.4
24	2021-04-28	17:00:00	01:00:00.0	01:00:00.0	61.9	51.3	17:10:12	77.3	17:25:53	70.4	66.7	61.0	57.9	54.6	52.6

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Residential to South

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Lmax, dBA	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Site Preparation										
Tractors/Loaders/Backhoes	1	84	600	40	0.40	62.4	58.4	Muffler (10 dB Reduction)	48.4	
Rubber Tired Dozers	1	85	600	40	0.40	63.4	59.4	Muffler (10 dB Reduction)	49.4	10.0
						Log Sum	62.0		52.0	
Grading										
Grader	1	85	600	40	0.40	63.4	59.4	Muffler (10 dB Reduction)	49.4	
Excavators	1	85	600	40	0.40	63.4	59.4	Muffler (10 dB Reduction)	49.4	
Rubber Tired Dozers	1	85	600	40	0.40	63.4	59.4	Muffler (10 dB Reduction)	49.4	10.0
Tractors/Loaders/Backhoes	3	84	600	40	1.20	62.4	63.2	Muffler (10 dB Reduction)	53.2	
						Log Sum	66.7		56.7	
Building Construction										
Cranes	1	83	600	16	0.16	61.4	53.5	Muffler (10 dB Reduction)	43.5	
Forklifts [2]	3	48	600	40	1.20	26.4	27.2	n/a	27.2	
Generator Set	1	81	600	50	0.50	59.4	56.4	Enclosure or Acoustic Tent (10 dB Reduction)	46.4	9.1
Welders	1	74	600	40	0.40	52.4	48.4	n/a	48.4	
Tractors/Loaders/Backhoes	3	84	600	40	1.20	62.4	63.2	Muffler (10 dB Reduction)	53.2	
						Log Sum	64.5		55.4	
Paving										
Pavers	2	77	600	50	1.00	55.4	55.4	Muffler (10 dB Reduction)	45.4	
Paving Equipment	2	85	600	20	0.40	63.4	59.4	Muffler (10 dB Reduction)	49.4	
Rollers	2	80	600	20	0.40	58.4	54.4	Muffler (10 dB Reduction)	44.4	
						Log Sum	61.8		51.8	
Architectural Coating										
Air Compressors	1	80	600	40	0.40	58.4	54.4	Enclosure or Acoustic Tent (10 dB Reduction)	44.4	10.0
						Log Sum	54.4		44.4	

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 Construciton 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 (structure).

Receptor - Residential to Southwest

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Lmax, dBA	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Site Preparation										
Tractors/Loaders/Backhoes	1	84	512	40	0.40	63.8	59.8	Muffler (10 dB Reduction)	49.8	10.0
Rubber Tired Dozers	1	85	512	40	0.40	64.8	60.8	Muffler (10 dB Reduction)	50.8	
						Log Sum	63.4		53.4	
Grading										
Grader	1	85	512	40	0.40	64.8	60.8	Muffler (10 dB Reduction)	50.8	10.0
Excavators	1	85	512	40	0.40	64.8	60.8	Muffler (10 dB Reduction)	50.8	
Rubber Tired Dozers	1	85	512	40	0.40	64.8	60.8	Muffler (10 dB Reduction)	50.8	
Tractors/Loaders/Backhoes	3	84	512	40	1.20	63.8	64.6	Muffler (10 dB Reduction)	54.6	
						Log Sum	68.1		58.1	
Building Construction										
Cranes	1	83	512	16	0.16	62.8	54.8	Muffler (10 dB Reduction)	44.8	9.1
Forklifts [2]	3	48	512	40	1.20	27.8	28.6	n/a	28.6	
Generator Set	1	81	512	50	0.50	60.8	57.8	Enclosure or Acoustic Tent (10 dB Reduction)	47.8	
Welders	1	74	512	40	0.40	53.8	49.8	n/a	49.8	
Tractors/Loaders/Backhoes	3	84	512	40	1.20	63.8	64.6	Muffler (10 dB Reduction)	54.6	
						Log Sum	65.9		56.8	
Paving										
Pavers	2	77	512	50	1.00	56.8	56.8	Muffler (10 dB Reduction)	46.8	
Paving Equipment	2	85	512	20	0.40	64.8	60.8	Muffler (10 dB Reduction)	50.8	
Rollers	2	80	512	20	0.40	59.8	55.8	Muffler (10 dB Reduction)	45.8	
						Log Sum	63.2		53.2	
Architectural Coating										
Air Compressors	1	80	512	40	0.40	59.8	55.8	Enclosure or Acoustic Tent (10 dB Reduction)	45.8	10.0
						Log Sum	55.8		45.8	

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 Construciton 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 (structure).

Receptor - Residential to West

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Lmax, dBA	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Site Preparation										
Tractors/Loaders/Backhoes	1	84	997	40	0.40	58.0	54.0	Muffler (10 dB Reduction)	44.0	
Rubber Tired Dozers	1	85	997	40	0.40	59.0	55.0	Muffler (10 dB Reduction)	45.0	10.0
						Log Sum	57.6		47.6	
Grading										
Grader	1	85	997	40	0.40	59.0	55.0	Muffler (10 dB Reduction)	45.0	
Excavators	1	85	997	40	0.40	59.0	55.0	Muffler (10 dB Reduction)	45.0	
Rubber Tired Dozers	1	85	997	40	0.40	59.0	55.0	Muffler (10 dB Reduction)	45.0	10.0
Tractors/Loaders/Backhoes	3	84	997	40	1.20	58.0	58.8	Muffler (10 dB Reduction)	48.8	
						Log Sum	62.3		52.3	
Building Construction										
Cranes	1	83	997	16	0.16	57.0	49.0	Muffler (10 dB Reduction)	39.0	
Forklifts [2]	3	48	997	40	1.20	22.0	22.8	n/a	22.8	
Generator Set	1	81	997	50	0.50	55.0	52.0	Enclosure or Acoustic Tent (10 dB Reduction)	42.0	9.1
Welders	1	74	997	40	0.40	48.0	44.0	n/a	44.0	
Tractors/Loaders/Backhoes	3	84	997	40	1.20	58.0	58.8	Muffler (10 dB Reduction)	48.8	
						Log Sum	60.1		51.0	
Paving										
Pavers	2	77	997	50	1.00	51.0	51.0	Muffler (10 dB Reduction)	41.0	
Paving Equipment	2	85	997	20	0.40	59.0	55.0	Muffler (10 dB Reduction)	45.0	
Rollers	2	80	997	20	0.40	54.0	50.0	Muffler (10 dB Reduction)	40.0	
						Log Sum	57.4		47.4	
Architectural Coating										
Air Compressors	1	80	997	40	0.40	54.0	50.0	Enclosure or Acoustic Tent (10 dB Reduction)	40.0	10.0
						Log Sum	50.0		40.0	

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 Construciton 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 (structure).

Receptor - Industrial to West

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Lmax, dBA	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Site Preparation										
Tractors/Loaders/Backhoes	1	84	374	40	0.40	66.5	62.5	Muffler (10 dB Reduction)	52.5	10.0
Rubber Tired Dozers	1	85	374	40	0.40	67.5	63.5	Muffler (10 dB Reduction)	53.5	
						Log Sum	66.1		56.1	
Grading										
Grader	1	85	374	40	0.40	67.5	63.5	Muffler (10 dB Reduction)	53.5	10.0
Excavators	1	85	374	40	0.40	67.5	63.5	Muffler (10 dB Reduction)	53.5	
Rubber Tired Dozers	1	85	374	40	0.40	67.5	63.5	Muffler (10 dB Reduction)	53.5	
Tractors/Loaders/Backhoes	3	84	374	40	1.20	66.5	67.3	Muffler (10 dB Reduction)	57.3	
						Log Sum	70.9		60.9	
Building Construction										
Cranes	1	83	374	16	0.16	65.5	57.6	Muffler (10 dB Reduction)	47.6	9.1
Forklifts [2]	3	48	374	40	1.20	30.5	31.3	n/a	31.3	
Generator Set	1	81	374	50	0.50	63.5	60.5	Enclosure or Acoustic Tent (10 dB Reduction)	50.5	
Welders	1	74	374	40	0.40	56.5	52.5	n/a	52.5	
Tractors/Loaders/Backhoes	3	84	374	40	1.20	66.5	67.3	Muffler (10 dB Reduction)	57.3	
						Log Sum	68.6		59.5	
Paving										
Pavers	2	77	374	50	1.00	59.5	59.5	Muffler (10 dB Reduction)	49.5	
Paving Equipment	2	85	374	20	0.40	67.5	63.5	Muffler (10 dB Reduction)	53.5	
Rollers	2	80	374	20	0.40	62.5	58.5	Muffler (10 dB Reduction)	48.5	
						Log Sum	65.9		55.9	
Architectural Coating										
Air Compressors	1	80	374	40	0.40	62.5	58.5	Enclosure or Acoustic Tent (10 dB Reduction)	48.5	10.0
						Log Sum	58.5		48.5	

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 Construciton 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 (structure).

Receptor - Commercial to Southeast

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Lmax, dBA	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Site Preparation										
Tractors/Loaders/Backhoes	1	84	1025	40	0.40	57.8	53.8	Muffler (10 dB Reduction)	43.8	10.0
Rubber Tired Dozers	1	85	1025	40	0.40	58.8	54.8	Muffler (10 dB Reduction)	44.8	
						Log Sum	57.3		47.3	
Grading										
Grader	1	85	1025	40	0.40	58.8	54.8	Muffler (10 dB Reduction)	44.8	10.0
Excavators	1	85	1025	40	0.40	58.8	54.8	Muffler (10 dB Reduction)	44.8	
Rubber Tired Dozers	1	85	1025	40	0.40	58.8	54.8	Muffler (10 dB Reduction)	44.8	
Tractors/Loaders/Backhoes	3	84	1025	40	1.20	57.8	58.6	Muffler (10 dB Reduction)	48.6	
						Log Sum	62.1		52.1	
Building Construction										
Cranes	1	83	1025	16	0.16	56.8	48.8	Muffler (10 dB Reduction)	38.8	9.1
Forklifts [2]	3	48	1025	40	1.20	21.8	22.6	n/a	22.6	
Generator Set	1	81	1025	50	0.50	54.8	51.8	Enclosure or Acoustic Tent (10 dB Reduction)	41.8	
Welders	1	74	1025	40	0.40	47.8	43.8	n/a	43.8	
Tractors/Loaders/Backhoes	3	84	1025	40	1.20	57.8	58.6	Muffler (10 dB Reduction)	48.6	
						Log Sum	59.9		50.7	
Paving										
Pavers	2	77	1025	50	1.00	50.8	50.8	Muffler (10 dB Reduction)	40.8	
Paving Equipment	2	85	1025	20	0.40	58.8	54.8	Muffler (10 dB Reduction)	44.8	
Rollers	2	80	1025	20	0.40	53.8	49.8	Muffler (10 dB Reduction)	39.8	
						Log Sum	57.1		47.1	
Architectural Coating										
Air Compressors	1	80	1025	40	0.40	53.8	49.8	Enclosure or Acoustic Tent (10 dB Reduction)	39.8	10.0
						Log Sum	49.8		39.8	

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 Construciton 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 (structure).

APPENDIX E

PROJECT GENERATED TRIPS FHWA WORKSHEETS

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Harvill Avenue**

Segment: **North of Orange Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	6303.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	50.00
										DISTANCE	50.00
INPUT PARAMETERS											
Vehicles per hour	365.05	7.56	12.61	271.03	1.26	2.10	67.23	10.51	17.51	% A	92
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		
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	% MT	3
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT	5
ADJUSTMENTS											
Flow	18.33	1.49	3.71	17.03	-6.29	-4.07	10.98	2.92	5.14		
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	71.60
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.57
LEQ	64.38	55.22	61.66	63.08	47.43	53.88	57.03	56.64	63.09	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	66.57		EVENING LEQ	63.68		NIGHT LEQ	64.77		Use hour?	no
										GRADE dB	0.00
		CNEL	**71.60**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Harvill Avenue**

Segment: **North of Orange Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	6501.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	50.00
										DISTANCE	50.00
INPUT PARAMETERS											
Vehicles per hour	372.65	9.31	13.95	276.67	1.55	2.33	68.63	12.93	19.38	% A	91.06
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		
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	% MT	3.58
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT	5.37
ADJUSTMENTS											
Flow	18.42	2.39	4.15	17.12	-5.39	-3.63	11.07	3.82	5.58		
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	72.01
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.84
LEQ	64.47	56.12	62.10	63.17	48.33	54.32	57.12	57.54	63.53	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	66.84		EVENING LEQ	63.83		NIGHT LEQ	65.23		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.01**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Harvill Avenue**

Segment: **South of Orange Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	7058.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	50.00
										DISTANCE	290.00
INPUT PARAMETERS											
Vehicles per hour	408.78	8.47	14.12	303.49	1.41	2.35	75.29	11.76	19.61	% A	92
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		
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	% MT	3
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT	5
ADJUSTMENTS											
Flow	18.82	1.98	4.20	17.53	-5.80	-3.58	11.47	3.41	5.63		
Distance	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	64.46
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	59.43
LEQ	57.24	48.07	54.52	55.94	40.29	46.74	49.89	49.50	55.94	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	59.43		EVENING LEQ	56.54		NIGHT LEQ	57.63		Use hour?	no
										GRADE dB	0.00
		CNEL	**64.46**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Harvill Avenue**

Segment: **South of Orange Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	7256.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	50.00
										DISTANCE	290.00
INPUT PARAMETERS											
Vehicles per hour	416.38	10.21	15.46	309.14	1.70	2.58	76.69	14.18	21.48	% A	91.15
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00		
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	% MT	3.52
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT	5.33
ADJUSTMENTS											
Flow	18.90	2.80	4.60	17.61	-4.99	-3.18	11.55	4.22	6.02		
Distance	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	-7.70	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	64.82
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	59.67
LEQ	57.32	48.88	54.91	56.02	41.10	47.13	49.97	50.31	56.34	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	59.67		EVENING LEQ	56.67		NIGHT LEQ	58.04		Use hour?	no
										GRADE dB	0.00
		CNEL	**64.82**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Orange Avenue**

Segment: **Western Project Driveway to Harvill Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	675.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	25.00
										DISTANCE	260.00
INPUT PARAMETERS											
Vehicles per hour	41.40	0.51	0.20	30.59	0.09	0.09	7.66	0.67	0.26	% A	97.4
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	% MT	1.84
NOISE CALCULATIONS											
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24	% HT	0.74
ADJUSTMENTS											
Flow	11.88	-7.24	-11.34	10.57	-14.75	-14.74	4.56	-5.99	-10.09		
Distance	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	45.23
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	40.75
LEQ	39.09	31.62	33.67	37.78	24.11	30.27	31.77	32.86	34.92	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	40.75		EVENING LEQ	38.65		NIGHT LEQ	38.16		Use hour?	no
										GRADE dB	0.00
		CNEL	**45.23**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19365 Harvill Trailer Storage Yard**

Road: **Orange Avenue**

Segment: **Western Project Driveway to Harvill Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	1071.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	25.00
										DISTANCE	260.00
INPUT PARAMETERS											
Vehicles per hour	56.61	4.06	2.85	41.83	0.72	1.30	10.48	5.41	3.80	% A	83.94
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	% MT	9.29
NOISE CALCULATIONS											
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24	% HT	6.75
ADJUSTMENTS											
Flow	13.24	1.80	0.26	11.93	-5.71	-3.13	5.92	3.05	1.51		
Distance	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	-7.23	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
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	CNEL	54.36
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	47.51
LEQ	40.45	40.65	45.27	39.14	33.15	41.88	33.13	41.90	46.52	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	47.51		EVENING LEQ	44.10		NIGHT LEQ	47.96		Use hour?	no
										GRADE dB	0.00
		CNEL	**54.36**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Riverside County Published Mix

Larger than Secondary

Buildout Traffic Noise

Harvill Ave - at closest portion of proposed building

	DAYTIME			EVENING			NIGHTTIME				
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	ADT	27300.00
										SPEED	50.00
							AUTOS			DISTANCE	130.00
INPUT PARAMETERS											
Vehicles per hour	1581.05	32.76	54.60	1173.75	5.46	9.10	291.07	45.50	75.83	% A	92.00
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	% MT	3.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% HT	5.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	LEFT	-90.00
										RIGHT	90.00
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	CNEL	73.81
ADJUSTMENTS										DAY LEQ	68.79
Flow	24.69	7.86	10.08	23.40	0.08	2.29	17.34	9.28	11.50		
Distance	-4.22	-4.22	-4.22	-4.22	-4.22	-4.22	-4.22	-4.22	-4.22	Day hour	89.00
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	Absorbtive?	no
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	Use hour?	no
LEQ	66.59	57.43	63.88	65.30	49.65	56.10	59.24	58.86	65.30	GRADE dB	0.00

DAY LEQ	68.79	EVENING LEQ	65.90	NIGHT LEQ	66.99	
CNEL	**73.81**					

APPENDIX F

SOUNDPLAN INPUT AND OUTPUT

Noise emissions of industry sources

Source name	Reference	Level		Frequency spectrum [dB(A)]										Corrections		
				31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Cwall dB	CI dB	CT dB
Refrigerated Truck Parking	Lw/m²	Day	98.0	-	79.6	83.6	87.6	90.6	93.6	91.6	86.6	81.6	-	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC1	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC2	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC3	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC4	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC5	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC6	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC7	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVAC8	Lw/	Day	78.7	42.5	46.5	59.5	64.5	58.5	69.5	71.5	70.5	72.5	72.5	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour		Road surface	Separated method	Lw,ref
			Day	Night			dB(A)
P1	Rest stop (Trucks)	77 Parking bays	0.060	0.000	Asphaltic driving lanes	no	100.4
P2	Rest stop (Trucks)	12 Parking bays	0.060	0.000	Asphaltic driving lanes	no	89.0
P3	Rest stop (Trucks)	2 Parking bays	0.060	0.000	Asphaltic driving lanes	no	80.0
P4	Rest stop (Trucks)	32 Parking bays	0.060	0.000	Asphaltic driving lanes	no	95.5
P5	Rest stop (Trucks)	12 Parking bays	0.060	0.000	Asphaltic driving lanes	no	89.0
P6	Visitors and staff	21 Parking bays	0.500	0.000	Asphaltic driving lanes	no	78.9
P7	Visitors and staff	6 Parking bays	0.500	0.000	Asphaltic driving lanes	no	70.8
P8	Visitors and staff	11 Parking bays	0.500	0.000	Asphaltic driving lanes	no	74.2
P9	Visitors and staff	10 Parking bays	0.060	0.000	Asphaltic driving lanes	no	73.0

Receiver list

No.	Receiver name	Building side	Floor	Limit		Level		Conflict	
				Day	Night	Day	Night	Day	Night
				dB(A)		dB(A)		dB	
1	1	-	GF	-	-	44.3	0.0	-	-
2	2	-	GF	-	-	46.4	0.0	-	-
3	3	-	GF	-	-	38.8	0.0	-	-
4	4	-	GF	-	-	40.7	0.0	-	-
5	5	-	GF	-	-	39.6	0.0	-	-

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Night
		dB(A)	
1 GF		44.3	0.0
HVAC1	-	18.7	-
HVAC2	-	18.5	-
HVAC3	-	19.9	-
HVAC4	-	20.2	-
HVAC5	-	22.7	-
HVAC6	-	23.0	-
HVAC7	-	25.4	-
HVAC8	-	25.8	-
P1	-	36.2	-
P2	-	25.3	-
P3	-	17.0	-
P4	-	35.3	-
P5	-	31.3	-
P6	-	28.8	-
P7	-	22.9	-
P8	-	21.5	-
P9	-	11.0	-
Refrigerated Truck Parking	-	41.7	-
2 GF		46.4	0.0
HVAC1	-	20.2	-
HVAC2	-	18.0	-
HVAC3	-	18.1	-
HVAC4	-	20.4	-
HVAC5	-	18.2	-
HVAC6	-	20.6	-
HVAC7	-	18.5	-
HVAC8	-	20.7	-
P1	-	38.8	-
P2	-	25.5	-
P3	-	16.9	-
P4	-	34.7	-
P5	-	31.7	-
P6	-	16.2	-
P7	-	14.0	-
P8	-	6.4	-
P9	-	9.6	-
Refrigerated Truck Parking	-	44.9	-
3 GF		38.8	0.0
HVAC1	-	11.6	-
HVAC2	-	11.1	-
HVAC3	-	11.1	-
HVAC4	-	11.7	-
HVAC5	-	11.1	-
HVAC6	-	11.7	-
HVAC7	-	11.2	-
HVAC8	-	11.7	-
P1	-	32.7	-
P2	-	21.8	-
P3	-	12.6	-
P4	-	27.2	-
P5	-	20.8	-
P6	-	12.1	-
P7	-	8.0	-
P8	-	0.6	-
P9	-	6.1	-
Refrigerated Truck Parking	-	36.7	-
4 GF		40.7	0.0
HVAC1	-	12.7	-
HVAC2	-	12.2	-
HVAC3	-	12.0	-
HVAC4	-	12.6	-

Contribution levels of the receivers

Source name	Traffic lane	Level Day	Night
		dB(A)	
HVAC5	-	12.0	-
HVAC6	-	12.5	-
HVAC7	-	11.9	-
HVAC8	-	12.4	-
P1	-	34.7	-
P2	-	24.3	-
P3	-	10.0	-
P4	-	28.2	-
P5	-	20.2	-
P6	-	16.2	-
P7	-	2.9	-
P8	-	1.5	-
P9	-	3.6	-
Refrigerated Truck Parking	-	38.8	-
5 GF		39.6	0.0
HVAC1	-	13.8	-
HVAC2	-	18.3	-
HVAC3	-	18.7	-
HVAC4	-	14.0	-
HVAC5	-	19.0	-
HVAC6	-	14.1	-
HVAC7	-	19.2	-
HVAC8	-	14.2	-
P1	-	33.4	-
P2	-	19.6	-
P3	-	9.1	-
P4	-	22.1	-
P5	-	23.7	-
P6	-	28.0	-
P7	-	20.3	-
P8	-	24.7	-
P9	-	6.7	-
Refrigerated Truck Parking	-	37.1	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19365 Harvill Trailer Storage Yard Project		Date: 3/19/21
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to Southwest		
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 =	350.00	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 =	0.002	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19365 Harvill Trailer Storage Yard Project		Date: 3/19/21
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to Southwest		
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 =	350.00	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 =	0.004	IN/SEC	OUTPUT IN BLUE

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