190TH STREET WAREHOUSE PROJECT NOISE IMPACT ANALYSIS

City of Torrance

May 27, 2020

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

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EXECUTIVE SUMMARY

The purpose of this report is to provide an assessment of the noise impacts associated with development and operation of the proposed 190th Street Warehouse project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the City of Torrance.

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 terms related to noise and vibration analysis.

PROJECT LOCATION

The proposed project is located at the northeast corner of Crenshaw Place and 190th Street at 2555 West 190th Street in the City of Torrance, California. The project site is currently developed with an existing 160,000 square foot office building that is currently vacant and has not been actively marketed pending the redevelopment of the subject property as proposed by the project, in addition to excess surface parking areas. The project location map is shown on Figure 1.

PROJECT DESCRIPTION

The proposed project includes development of a state-of-the-art industrial warehouse/manufacturing building with 305,550 square feet of floor area consisting of 86,780 square feet of warehouse, 198,400 square feet of manufacturing, and 20,370 square feet of office, inclusive of 14,550 square feet of mezzanine space. The project would require demolition of the existing approximately 160,000 square foot office building. Figure 2 illustrates the proposed site plan.

PROJECT IMPACTS

Construction Impacts

Modeled unmitigated construction noise levels when combined with existing measured noise levels could reach 74 dBA L_{eq} at the nearest industrial property line to the north, 78 dBA L_{eq} at the nearest commercial property line to the northeast of the project site, 76 dBA L_{eq} at the nearest church property line to the east, 68 dBA L_{eq} at the nearest commercial property line to the west, and 69 dBA L_{eq} at the nearest residential property line to the west of the project site.

Construction noise sources are regulated within the City of Torrance Section 46.3.1 which prohibits construction activities involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. Furthermore, per Section 46.3.1(d), properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer. The proposed project is that of an industrial use; however, residential uses are located approximately 200 feet west of the western boundary of the project site. Therefore, the above listed day and hour restrictions in Section 46.3.1 of the City's Municipal Code would apply.

The City of Torrance has not adopted a numerical threshold that identifies what a substantial increase would be during the allowed hours of construction (see above Section 46.3.1 of City's Municipal Code). For purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment

(2006) criteria was utilized to establish significance thresholds. 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 $L_{eq\ (8\text{-}hr)}$.

Therefore, project construction would not be anticipated to exceed the FTA thresholds for either residential or commercial uses. Further, with compliance with the City's Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Impacts related to construction noise will be further minimized with adherence to applicable Municipal Ordinances and implementation of the measures presented in Section 7 of this report. Impacts would be less than significant.

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

Existing and Existing Plus Project noise levels along West 190th Street and other roadway segments affected by project generated vehicle trips were modeled utilizing the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 in order to quantify the proposed project's contribution to increases in ambient noise levels.

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 City'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.

Per the noise modeling, all of the modeled roadway segments are anticipated to change the noise a nominal amount (between approximately 0.01 to 3.52 dBA CNEL). Therefore, a change in noise level would not be audible and would be considered less than significant.

Transportation Noise Impacts to the Proposed Project

Per the City of Torrance General Plan, interior noise levels of up to 55 dBA CNEL and exterior noise levels of up to 75 dBA CNEL are considered acceptable for industrial uses.

Roadways that may generate enough traffic noise under buildout conditions to effect the proposed industrial use include West 190th Street. FHWA modeling was conducted to calculate noise levels associated with buildout vehicle traffic noise from West 190th Street. Future buildout traffic noise levels could reach up to approximately 74.7 dBA CNEL at the proposed industrial building, approximately 135 feet north of the roadway.

The exterior noise levels at the proposed project site are anticipated to fall within the City's acceptable standards for industrial land 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

Peak hour project operational noise is expected to reach up to 54.9 dBA L_{eq} at nearby church uses and up to 54.2 dBA L_{eq} at nearby residential land uses and will not exceed applicable daytime or nighttime noise standards. This impact is less than significant. No mitigation is required.

Groundborne Vibration Impacts

The nearest off-site structure to the project site is the commercial building located approximately 10 feet from the northern property line (at the northeastern corner of the project site). Due to the proximity of the adjacent commercial use to the north, use of a vibratory roller within 16 feet or a large bulldozer within five feet of the

northern property line adjacent to the building may result in groundborne vibration that is annoying. However, annoyance is expected to be short-term. Further, use of a vibratory roller within seven (7) feet of the northern property line adjacent to the building has the potential to result in architectural damage. Mitigation measures limiting the use of vibratory rollers or large bulldozers along the northern property line would reduce potential impacts. Mitigation measures are presented in Section 7 of this report. With incorporation of mitigation, impacts associated with construction activities would be less than significant.

CONSTRUCTION NOISE REDUCTION MEASURES

In addition to adherence to the City of Torrance 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.

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

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

7. Caution should be utilized if vibratory equipment such as vibratory rollers, or other similar vibratory equipment, are utilized within 16 feet or large bulldozers within five (5) feet of the portion of the northern property line that lies adjacent to the existing commercial building.

8. The use of vibratory equipment such vibratory rollers, or other similar vibratory equipment, is prohibited within seven (7) feet of the northern property line that lies adjacent to the existing commercial building.

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 impacts resulting from development of the proposed 190th Street Warehouse project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the City of Torrance.

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 terms related to noise and vibration analysis.

PROJECT LOCATION

The proposed project is located at the northeast corner of Crenshaw Place and 190th Street at 2555 West 190th Street in the City of Torrance, California. The project site is currently developed with an existing 160,000 square foot office building that is currently vacant and has not been actively marketed pending the redevelopment of the subject property as proposed by the project, in addition to excess surface parking areas. The project location map is shown on Figure 1.

PROJECT DESCRIPTION

The proposed project includes development of a state-of-the-art industrial warehouse/manufacturing with 305,550 square feet of floor area consisting of 86,780 square feet of warehouse, 198,400 square feet of manufacturing, and 20,370 square feet of office, inclusive of 14,550 square feet of mezzanine space. The project would require demolition of the existing approximately 160,000 square foot office building. Figure 2 illustrates the proposed 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, $L_{eq(3)}$ 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.

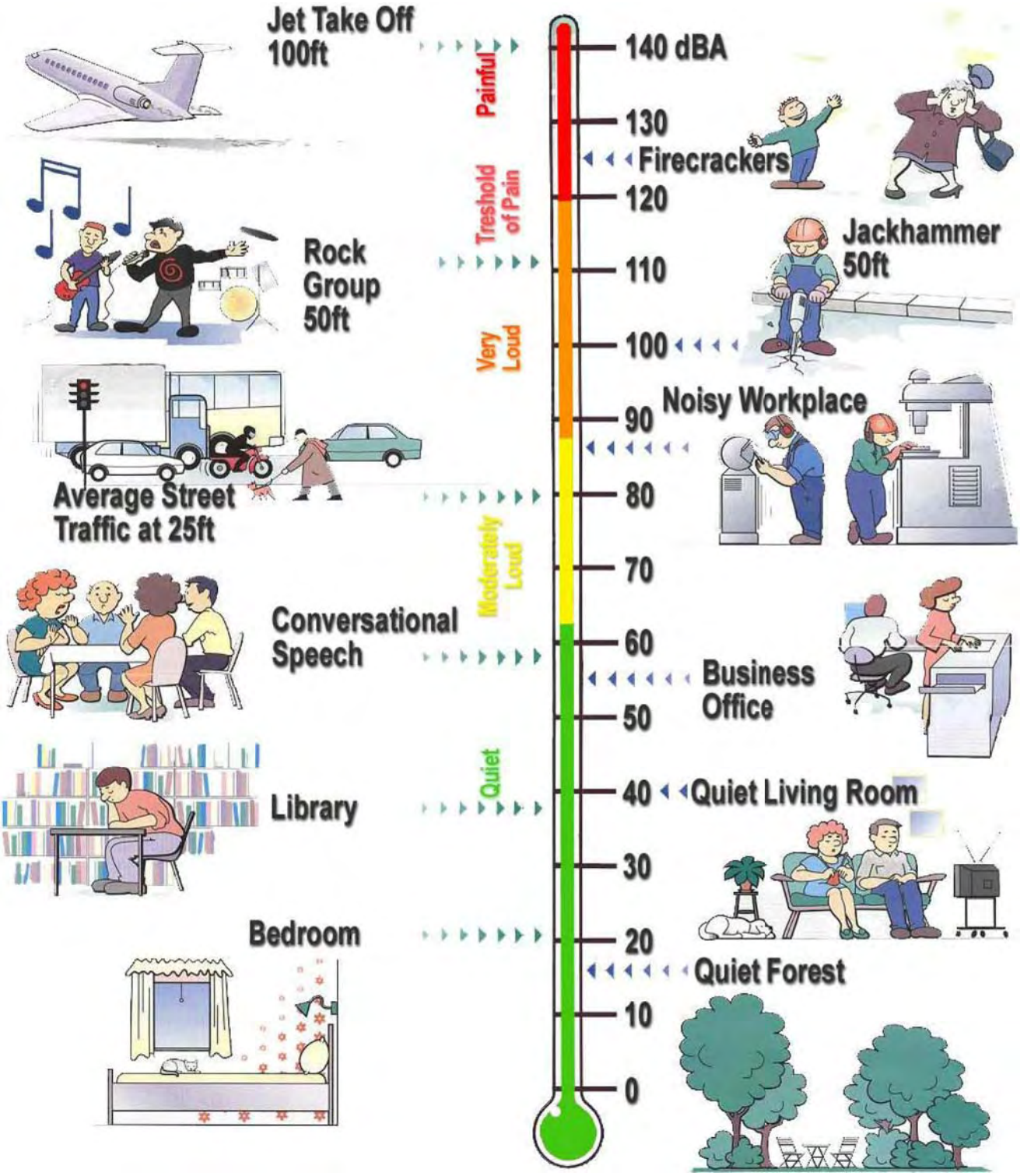
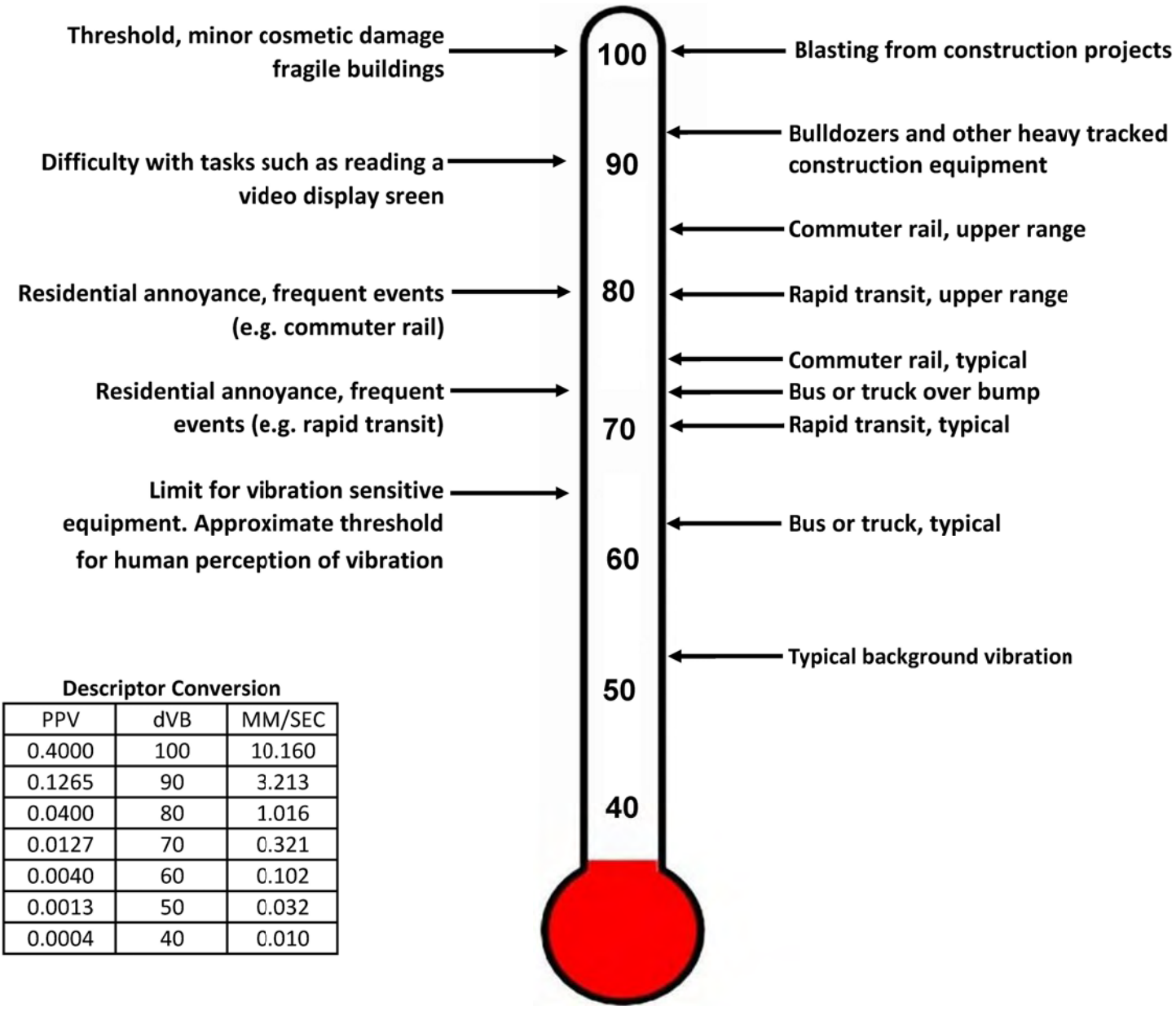


Figure 3
Weighted Sound Levels and Human Response

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 Crenshaw Place to the west, West 190th Street to the south, industrial and office uses to the north, and church, commercial and office uses to the east.

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 church use located adjacent to the east, the single-family detached residential dwelling units located as close as approximately 200 feet west, the church use located approximately 240 feet west, and the single-family detached residential dwelling units located approximately 0.31 miles east of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section SI4 1979, Type 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 1:10 PM and 2:45 PM on May 16, 2020. In addition, one (1) long-term 15-hour noise measurement was also taken from May 16, 2020 to May 17, 2020. Field worksheets and noise measurement output data are included in Appendix C.

As shown on Figure 5, the noise measurements were taken east of the project site at adjacent church and commercial uses (STNM1); west of the project site near commercial uses and Crenshaw Place (STNM2); west of Crenshaw Boulevard near existing church and residential uses (STNM3); and at the project site just southwest of the existing building that is to be demolished (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 52.3 and 66.4 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 54.1 to 60.3 dBA L_{eq}. The dominant noise sources included conversation/recreational noise and vehicles traveling along Crenshaw Place, Crenshaw Boulevard, Interstate 405 Freeway, 190th Street, and other surrounding roadways.

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	1:10 PM	52.3	61.5	49.0	57.6	54.6	52.3	51.3
STNM2	1:57 PM	57.7	73.8	48.7	67.7	59.7	54.5	52.5
STNM3	2:30 PM	66.4	74.9	54.9	71.0	69.4	67.7	65.7

Notes:

(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.

(2) Noise measurements performed on May 16, 2020.

Table 2
Long-Term Noise Measurement Summary (dBA)

15-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	5:00 PM	57.8	72.7	49.2	62.6	60.8	58.8	56.8
1	5:00 PM	60.3	71.0	55.2	64.2	62.4	60.9	59.5
2	6:00 PM	54.1	72.3	54.9	64.0	62.6	60.8	59.4
3	7:00 PM	54.2	72.7	55.4	63.6	62.2	60.7	59.4
4	8:00 PM	54.8	67.3	55.1	63.0	61.6	60.0	58.6
5	9:00 PM	55.2	69.0	54.5	62.0	60.5	59.1	57.9
6	10:00 PM	55.5	72.2	54.2	62.5	61.3	60.1	59.1
7	11:00 PM	55.7	69.8	54.1	61.4	59.8	58.3	57.2
8	12:00 AM	56.8	65.0	53.6	60.7	59.1	57.5	56.6
9	1:00 AM	57.1	71.5	53.0	60.0	58.4	57.2	56.3
10	2:00 AM	57.8	61.2	51.8	58.7	56.7	55.3	54.1
11	3:00 AM	58.5	60.0	51.4	57.5	56.5	55.8	55.0
12	4:00 AM	59.3	69.7	49.6	57.6	56.3	54.7	53.0
13	5:00 AM	59.4	63.1	50.3	58.7	56.5	54.5	53.2
14	6:00 AM	60.0	69.3	51.2	60.3	58.2	55.9	54.4
15	7:00 AM	60.1	69.4	49.2	60.9	58.6	56.0	54.1

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 15-hour duration.

(2) Noise measurement performed from May 16, 2020 to May 17, 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 City of Torrance 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 City of Torrance Section 46.3.1 which prohibits construction activities involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall.

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

The City of Torrance has not adopted a numerical threshold that identifies what a substantial increase would be during the allowed hours of construction (see above Section 46.3.1 of City's Municipal Code). For purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria was utilized to establish significance thresholds. 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 City's Municipal Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Project Operational Noise (permanent): 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 City'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?

As shown in Table 4, a peak particle velocity (PPV) of 0.20 is the threshold at which there is a risk to "architectural" damage to normal dwellings. It is also the level at which groundborne vibration can become annoying. Impacts would be significant if construction activities result in groundborne vibration of 0.20 PPV or higher at a sensitive receptor.

California Department of Transportation (Caltrans)

The California Department of Transportation has published one of the seminal works for the analysis of ground-borne noise and vibration relating to transportation- and construction-induced vibrations and although the project is not subject to these regulations, it serves as useful tools to evaluate vibration impacts. These guidelines recommend that a standard of 0.2 inches per section (in/sec) PPV not be exceeded for the

protection of normal residential buildings (California Department of Transportation, 2013). This is the appropriate threshold for construction related ground-borne vibration impacts.

LOCAL REGULATIONS

City of Torrance General Plan

Applicable City of Torrance General Plan goals, objectives, and policies which apply to the proposed project are presented below.

Goal	Minimize exposure of residents to noise.
Objective N.1	To identify noise pollution and establish effective noise abatement methods.
Policy N.1.1	Continue to strictly enforce the provisions of the City's Noise Ordinance to ensure that stationary noise, traffic-related noise, railroad noise, airport-related noise, and noise emanating from construction activities and special events are minimized.
Policy N.1.4	Minimize unnecessary outdoor noise through enforcement of the noise ordinance and through permit processes that regulate noise-producing activities.
Objective N.2	To minimize transportation-related noise impacts.
Policy N.2.3	Require developers and business owners to minimize noise impacts associated with on-site motor vehicle activity through the use of noise-reduction features (e.g., berms, walls, well designed site plans).
Objective N.3	To minimize noise incompatibilities between land uses.
Policy N.3.1	Review industrial, commercial, or other noise-generating land use proposals for compatibility with nearby noise-sensitive land uses, and require that appropriate mitigation be provided.
Policy N.3.2	Require the inclusion of noise-reducing design features for developments near noise-sensitive land uses.
Policy N.3.3	Encourage dense, attractive landscape planting along roadways and adjacent to other noise sources to increase absorption of noise.
Policy N.3.4	Work with property and business owners to avoid or resolve noise incompatibilities in commercial or industrial areas.

City of Torrance Municipal Code

In addition to any measures to reduce noise levels recommended in this report, project operations will be subject to the following City ordinances.

Section 46.2.6 Machinery, Equipment, Fans and Air Conditioning.

It shall be unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any residential land to exceed the ambient noise level by more than five (5) decibels.

Section 46.3.1 Construction of Buildings and Projects.

The following activities, among others, are declared to cause disturbing, excessive or offensive noises in violation of the noise chapter and are unlawful, namely:

A. It shall be unlawful for any person within the City of Torrance to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. An exception exists between the hours of 10:00 AM to 4:00 PM for homeowners that reside at the property.

B. The Community Development Director may allow expanded hours and days of construction if unusual circumstances and conditions exist. Such requests must be made in writing and must receive approval by the Director prior to any expansion of the hour and day restrictions listed above.

C. Every construction project requiring Planning Commission review or considered to be a significant remodel as defined by Section 231.1.2 of the City's Code, shall be required to post an information board along the front property line that displays the property owner's name and contact number, contractor's name and contact number, a copy of TMC Section 46.3.1 of the City's Code, a list of any special conditions, and the Code Enforcement phone number where violations can be reported.

D. Properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer.

E. Heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors or similar devices shall not be operated at any time, within or adjacent to a residential area, without first obtaining from the Community Development Director permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use, and the applicant shall be required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers. Such permission to operate heavy construction equipment will be revoked if operation of such equipment is not in accordance to approval. No permission shall be required to perform emergency work as defined in Article 1 of the Noise Regulation Chapter of the City's Code.

Section 46.7.2 Noise Limits.

Per the City's General Plan, the below description is provided for the Regions identified in Section 46.7.2 Noise Limits of the City's Municipal Code.

Region 1 includes the predominantly industrial areas in and around the refineries and industrial uses on the western edge of the City, Region 2 includes the area in and around the airport and includes the commercial and industrial uses south of Lomita Boulevard and north of Pacific Coast Highway, Region 3 encompasses the residential neighborhoods south of the Pacific Coast Highway and west of Hawthorne Boulevard and Region 4 includes the remainder of the City (please also refer to Figure N-5, Noise Limit Regions of the City of Torrance General Plan).

The project site and surrounding uses are located in Region 4 and are located further than 500 feet from the boundaries of Regions 1 and 2.

a) Noise Limits on Residential Land. It shall be unlawful for any person within the City of Torrance (wherever located) to produce noise in excess of the following levels as received on residential land owned or occupied by another person within the designated regions. In addition to the noise limits stated herein, the noise limits set forth in Section 46.7.2.b) shall also be complied with.

1. For noise receivers located on residential land, for measurement positions five hundred (500) feet or more from the boundaries of Regions 1 and 2, the following limits apply:

Region (in which noise receiver is located)	Noise Level, db	
	Day	Night
3	50	45
4	55	50

2. For noise receivers located on residential land, for positions within five hundred (500) feet from the boundary of Region 1 or 2, the following limits apply:

- Five (5) dB above the limits set forth in Section 46.7.2.a) 1 above, or 5 dB above the ambient noise level, whichever is the lower number.

b) Noise Limits at Industrial and Commercial Boundaries:

1. Noise Sources in Region 1: It shall be unlawful for any person in Region 1 to produce noise levels at the boundary of Region 1 in excess of 70 dB during the day or 65 dB during the night.

2. Noise Sources in Region 2: It shall be unlawful for any person in Region 2 to produce noise levels at the boundary of Region 2 in excess of 60 dB during the day or 55 dB during the night.

3. Noise Sources in All Remaining Industrial Use Land: It shall be unlawful for any person on industrial use land outside Region 1 and 2 to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

4. Noise Sources on All Land Use for Commercial Purposes: It shall be unlawful for any person on land used for commercial purposes to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

c) Corrections to the noise Limits: The numerical limits given in Sec. 46.7.2.(a) and (b) shall be adjusted by addition of the following corrections where appropriate.

	Noise Conditions	Correction to the Limits, decibels
1	Noise contains a steady, audible tone, such as a whine, screech or hum	-5
2	Noise is a repetitive impulsive noise, such as hammering or riveting	-5
3	If the noise is not continuous, one of the following corrections to the limits shall be applied:	
	a) Noise occurs less than 5 hours per day or less than 1 hour per night	5
	b) Noise occurs less than 90 minutes per day or less than 20 minutes per night	10
	c) Noise occurs less than 30 minutes per day or less than 6 minutes per night	15
4	Noise occurs on Sunday morning (between 12:01 A.M. and 12:01 P.M. Sunday)	-5

Table 3
City of Torrance Noise/Land Use Compatibility Guidelines

Property Receiving Noise		Maximum Noise Level Ldn or CNEL, dB(A)	
Type of Use	Land Use Designations	Interior	Exterior
Residential[3]	Low Density Residential, Low Medium Density Residential, Medium Density Residential	45	60/65 [1]
	Medium High Density Residential	45	65/70 [2]
	High Density Residential	45	70 [1]
Commercial and Office	General Commercial, Commercial Center	-	70
	Residential Office	50	70
Industrial	Business Park	55	75
	Light Industrial		
	Heavy Industrial		
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	-	70

Notes:

Source: City of Torrance General Plan Noise Element Table N-3, 2010.

(1) The normally acceptable standard is 60 db(A). The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.

(2) Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple Family Housing.

(3) Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB(A) CNEL.

Table 4
Typical Human Reaction and Effect on Buildings Due to Groundborne Vibration

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

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 6 Tables 5 and 12, September 2013.

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. Construction noise levels were calculated for each phase based on assumptions provided in the Air Quality Study prepared for the project (Ganddini 2020). 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 surrounding sensitive receptors. For the demolition phase, the center of the site was assumed to be the center of the proposed area of demolition for the existing building. Construction noise worksheets are provided in Appendix D.

FEDERAL HIGHWAY ADMINISTRATION (FHWA) TRAFFIC NOISE PREDICTION MODEL

Existing and Existing Plus project traffic noise levels were modeled for roadways affected by project generated traffic utilizing the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 in order to quantify the proposed project's contribution to increases in ambient noise levels. Future traffic noise levels were modeled to assess potential traffic related impacts to the proposed project.

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). Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). Surfaces adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. 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 amount 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. Roadways that may generate enough traffic noise under buildout conditions to affect the proposed industrial use include West 190th Street. The City of Torrance General Plan identifies West 190th Street as a Major Arterial roadway. Per the Programmatic Traffic Impact Study prepared for the County of Los Angeles General Plan Update and the Complete Streets Design Guide, Major Highways (6-lane) have a daily roadway capacity of 54,000, and an approximate LOS C of 40,500.[1] As posted, a speed of 45 miles per hour was utilized for modeling purposes. Neither the City of Torrance nor the County of Los Angeles have vehicle mix data published for use in noise studies, so vehicle/truck mixes and D/E/N splits for use in acoustical studies published by the Riverside County Department of Industrial Hygiene were utilized for noise modeling. Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions.

Existing and Existing Plus Project vehicle mix were obtained from the project traffic study (Linscott Law & Greenspan Engineers 2019). Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

[1] The County's Programmatic Traffic Study was utilized as the City does not have buildout average daily vehicle trips available for use in acoustical studies.

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 the SoundPLAN model. Modeled noise sources include parking lot noise, HVAC equipment, and loading/unloading activities.

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.[2]

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, which 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 based on the following formula:

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

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

Mechanical Equipment (HVAC Units)

A noise reference level obtained by MD Acoustics of 67.7 dBA at 3 feet (sound power level of 78.7 dB) was utilized to represent rooftop 5 Ton Carrier HVAC units.[3] 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. MD assumed 50 (fifty) RTU units on the rooftop even spaced across the roof. The noise source height for each HVAC unit was assumed at 1 meter above the roof top. Roof top is assumed to be approximately 35 feet above grade.

Loading/Unloading Activities

The loading area associated with the proposed industrial building was modeled as an area source with a sound power level of 80 dBA L_{eq} per square meter.

[2] SoundPLAN Essential 4.0 Manual. SoundPLAN International, LLC. May 2016.
[3] 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 City of Torrance standards related to: construction, operation, and transportation noise related impacts to, or from, the proposed project.

IMPACTS RELATED TO CONSTRUCTION NOISE

The existing church use located adjacent to the east and the single-family detached residential dwelling units located to the 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.

The construction phases for the proposed project are anticipated to include: site preparation, grading, building construction, paving and architectural coating. A summary of noise level data for a variety of construction equipment compiled by the Federal Transit Administration (FTA) is presented in Table 5. Typical 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.

As discussed previously, construction noise associated with the proposed project was calculated utilizing methodology presented in the 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. Construction noise levels were calculated for each phase. Worksheets are included as Appendix D.

Construction noise levels are compared to existing noise levels in Table 1 of this report. STNM1 was chosen to represent the church and commercial property lines of properties to the east and northeast, STNM2 was chosen to represent noise levels at the industrial property lines of properties to the north and the commercial property lines of properties to the west, and STNM3 was chosen to represent noise levels at the residential property lines of properties to the west. As shown in Table 6, modeled unmitigated construction noise levels when combined with existing measured noise levels could reach 74 dBA L_{eq} at the nearest industrial property line to the north, 78 dBA L_{eq} at the nearest commercial property line to the northeast of the project site, 76 dBA L_{eq} at the nearest church property line to the east, 68 dBA L_{eq} at the nearest commercial property line to the west, and 69 dBA L_{eq} at the nearest residential property line to the west of the project site.

As discussed earlier, construction noise sources are regulated within the City of Torrance Section 46.3.1. Section 46.3.1(a) prohibits construction activities involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. Furthermore, per Section 46.3.1(d), properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer. The proposed project is that of an industrial use; however, residential uses are located approximately 200 feet west of the western boundary of the project site. Therefore, the above listed day and hour restrictions in Section 46.3.1 of the City's Municipal Code would apply.

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 either residential or commercial uses.

Further, with compliance with the City's Municipal Code, it is assumed that construction would not occur during the noise-sensitive nighttime hours.

Impacts related to construction noise will be further minimized with adherence to the above Municipal Ordinances and implementation of the measures 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 1,417 average daily trips (PCE) with 222 trips during the AM peak-hour and 253 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. 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. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 7. 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 7.

Existing Plus Project: This scenario refers to existing year plus project traffic noise conditions and is demonstrated in Table 7.

As shown in Table 8, modeled Existing traffic noise levels range between 52-78 dBA CNEL at the right-of-way of each modeled roadway segment; and the modeled Existing Plus Project traffic noise levels range between 56-78 dBA CNEL at the right-of-way of each modeled roadway segment.

As stated previously, 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 City'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.

All modeled roadway segments are anticipated to change the noise a nominal amount (between approximately 0.01 to 3.52 dBA CNEL). Therefore, a change in noise level would not be audible and would be considered less than significant. No mitigation is required.

TRANSPORTATION NOISE IMPACTS TO THE PROPOSED PROJECT

Per the City of Torrance General Plan, interior noise levels of up to 55 dBA CNEL and exterior noise levels of up to 75 dBA CNEL are considered acceptable for industrial uses (see Table 3).

Roadways that may generate enough traffic noise under buildout conditions to effect the proposed industrial use include West 190th Street. The City of Torrance General Plan identifies West 190th Street as a Major Arterial roadway. Per the Programmatic Traffic Impact Study prepared for the County of Los Angeles General Plan Update and the Complete Streets Design Guide, Major Highways (6-lane) have a daily roadway capacity of 54,000, and an approximate LOS C of 40,500.[4] As posted, a speed of 45 miles per hour was utilized for modeling purposes. Neither the City of Torrance nor the County of Los Angeles have vehicle mix data

[4] The County's Programmatic Traffic Study was utilized as the City does not have buildout average daily vehicle trips available for use in acoustical studies.

published for use in noise studies, so vehicle/truck mixes and D/E/N splits for use in acoustical studies published by the Riverside County Department of Industrial Hygiene were utilized for noise modeling. Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions.

FHWA modeling was conducted to calculate noise levels associated with buildout vehicle traffic noise from West 190th Street. Exterior future buildout traffic noise levels could reach up to approximately 74.7 dBA CNEL at the proposed industrial building, approximately 135 feet north of the roadway. Modeling spreadsheets are presented in Appendix E.

The exterior noise levels at the proposed project site are anticipated to fall within the City's acceptable standards for industrial land 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

Sensitive land uses that may be affected by project noise include the church use located adjacent to the eat, the single-family detached residential dwelling units located as close as approximately 200 feet west, the church use located approximately 240 feet west, and the single-family detached residential dwelling units located approximately 0.31 miles east of the project site. Project operational noise levels at receptors are shown on Figure 6.

Compliance with General Plan Goals and Policies

The City of Torrance has adopted two General Plan goals: 1) to minimize noise exposure to residents, and 2) to minimize noise incompatibilities between land uses. City of Torrance General Plan Noise Element policies in regards to operational noise include recommendations to enforce the City's Noise Ordinance, to review projects for potential incompatibilities related to noise, and to use design features to minimize noise.

Compliance with Noise Ordinance Stationary Noise Standards

Section 46.7.2.2(a) of the City of Torrance Municipal Code sets forth noise standards based on the category of the receiving land use, the time of day, and which "noise region" the receiver is located. The project site and nearby land uses to the north, east and west are located within Region 4. However, because the affected receivers are also located within 500 feet of a Region 2 boundary, the limits identified in Section 46.7.2.2(a) or the ambient noise level, whichever is lower, are to be raised by 5 dB.

Furthermore, the City of Torrance has not established noise standards for operational noise impacts to church uses. Per Section 46.7.2(b) of the City's Municipal Code, it shall be unlawful for any person on industrial use land (outside Region 1 and 2) and commercial land to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night. Section 46.7.2(b) has been utilized for church uses.

The measured ambient noise levels at the church use adjacent to the east that may be affected by the proposed project are represented by STNM1 and the residential and church land uses to the west that may be affected by the proposed project are represented by STNM3 (shown on Figure 5). Existing measured daytime noise levels reach up to 66.4 dBA L_{eq}; and nighttime noise levels reach up to 60.1 dBA L_{eq}. For church receptors represented by STNM1 and residential and church receptors represented by STNM3, project generated operational noise is not to exceed 60 dBA between the hours of 7:00 AM and 10:00 PM; or exceed 55 dBA between the hours of 10:00 PM and 7:00 AM.

As shown in Figure 6, peak hour project operational noise is expected to reach up to 54.9 dBA L_{eq} at receptor 1 (represented by STNM1) and up to 54.2 dBA L_{eq} at receptor 3 (represented by STNM3) and will not exceed applicable daytime or nighttime noise standards. This impact is 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. For example, as shown in Table 10, 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.

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. As shown in Table 4, vibration can be annoying to people in buildings at a PPV of 0.20.

The closest off-site structure is the existing commercial building located approximately 10 feet north of the project site (at the northeastern corner of the project site). At 10 feet, use of a vibratory roller would be expected to generate a PPV of 0.830 and a bulldozer would be expected to generate a PPV of 0.352. Caution should be utilized if a vibratory roller, or other similar vibratory equipment, is utilized within 16 feet and a bulldozer is utilized within five feet of the northern property line that lies adjacent to the commercial building located to the north of the project site.

At 50 feet, which is the distance to the next closest off-site building, the church and commercial uses to the east of the project site, use of a vibratory roller would be expected to generate a PPV of 0.074 and a bulldozer would be expected to generate a PPV of 0.031. Use of either a vibratory roller or a bulldozer would not be considered annoying to receptors to the east.

At 60 feet, which is the distance to the closest commercial uses to the west of the project site, use of a vibratory roller would be expected to generate a PPV of 0.056 and a bulldozer would be expected to generate a PPV of 0.024. Use of either a vibratory roller or a bulldozer would not be considered annoying to receptors to the west.

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. Table 4 identifies a PPV levels between 0.4 and 0.6 as vibration levels greater than normally expected from traffic, but may cause “architectural” damage and possible minor structural damage.

The only receptor with the potential of architectural damage as a result of the construction of the proposed project would be the commercial building located approximately 10 feet north of the northern property line of the project site. Due to the proximity of the adjacent commercial building to the north, use of a vibratory roller within seven (7) feet of the northern property line that lies adjacent to the commercial building to the north may result in architectural damage. Mitigation measures limiting the use of vibratory rollers and bulldozers along the northern property line would reduce potential impacts. Mitigation measures are presented in Section 7 of this report. Vibration worksheets are provided in Appendix G.

CEQA CHECKLIST

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?*

Construction Noise Impacts

Construction noise will result in temporary increases in ambient noise levels. This impact is considered significant if this increase is in excess of standards established in the City's General Plan or Noise Ordinance. Construction noise sources are regulated within the City of Torrance Section 46.3.1. Section 46.3.1(a) prohibits construction activities involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. Furthermore, per Section 46.3.1(d), properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer.

The proposed project is that of an industrial use; however, residential uses are located approximately 200 feet west of the western boundary of the project site. Therefore, the above listed day and hour restrictions in Section 46.3.1 of the City's Municipal Code would apply. Project compliance with Section 46.3.1(a) of the City's Municipal Code will result in less than significant impacts. Measures to further reduce construction noise are presented in Section 7 of this report.

Noise Impacts to Proposed Industrial Uses

The City of Torrance General Plan identifies interior noise levels of up to 55 dBA CNEL and exterior noise levels of up to 75 dBA CNEL are considered acceptable for industrial uses (see Table 3).

Roadways that may generate enough traffic noise under buildout conditions to affect the proposed industrial use include West 190th Street. The City of Torrance General Plan identifies West 190th Street as a Major Arterial roadway. Per the Programmatic Traffic Impact Study prepared for the County of Los Angeles General Plan Update and the Complete Streets Design Guide, Major Highways (6-lane) have a daily roadway capacity of 54,000, and an approximate LOS C of 40,500.[5] As posted, a speed of 45 miles per hour was utilized for modeling purposes. Neither the City of Torrance nor the County of Los Angeles have vehicle mix data published for use in noise studies, so vehicle/truck mixes and D/E/N splits for use in acoustical studies published by the Riverside County Department of Industrial Hygiene were utilized for noise modeling. Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions.

FHWA modeling was conducted to calculate noise levels associated with buildout vehicle traffic noise from West 190th Street. Exterior future buildout traffic noise levels could reach up to approximately 74.7 dBA CNEL at the proposed industrial building, approximately 135 feet north of the roadway. Modeling spreadsheets are presented in Appendix E.

[5] The County's Programmatic Traffic Study was utilized as the City does not have buildout average daily vehicle trips available for use in acoustical studies.

The exterior noise levels at the proposed project site are anticipated to fall within the City's acceptable standards for industrial land uses. Impacts related to future traffic noise impacts to the proposed project would be less than significant. No mitigation is required.

Off-Site Project Generated Vehicle Noise Impacts

The proposed project is anticipated to generate 1,417 average daily trips (PCE) with 222 trips during the AM peak hour and 253 trips during the PM peak hour.

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 City'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.

In order to quantify the project's contribution to existing ambient noise levels, existing traffic noise levels, and worst-case project generated traffic noise levels were modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108, for all road segments affected by project generated vehicle noise. 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. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 7.

As shown in Table 8, modeled Existing traffic noise levels range between 52-78 dBA CNEL at the right-of-way of each modeled roadway segment; and the modeled Existing Plus Project traffic noise levels range between 56-78 dBA CNEL at the right-of-way of each modeled roadway segment.

All modeled roadway segments are anticipated to change the noise a nominal amount (between approximately 0.01 to 3.52 dBA CNEL). Therefore, a change in noise level would not be audible and would be considered less than significant. Project generated vehicle traffic would not substantially increase ambient noise levels. No mitigation is required.

On-Site Operational Noise

Peak hour project operational noise is expected to reach up to 54.9 dBA L_{eq} at nearby church uses and 54.2 dBA L_{eq} at nearby residential land uses. The existing measured daytime noise level was 66.4 dBA L_{eq} and the lowest nearby nighttime noise measurement was 54.1. Peak hour project operation may result in an increase of less than 1 dBA at the closest residential receptors and of up to 2.6 dBA at the closest church receptors. Impacts would be less than significant. No mitigation is required.

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

Table 10 identifies various vibration velocity levels for typical construction equipment.

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. As shown in Table 4 vibration can be annoying to people in buildings at a PPV of 0.20.

The closest off-site structure is the existing commercial building located approximately 10 feet north of the project site (at the northeastern corner of the project site). At 10 feet, use of a vibratory roller would be expected to generate a PPV of 0.830 and a bulldozer would be expected to generate a PPV of 0.352. Caution should be utilized if a vibratory roller, or other similar vibratory equipment, is utilized within 16 feet and a bulldozer is utilized within five feet of the northern property line that lies adjacent to the commercial building located to the north of the project site.

At 50 feet, which is the distance to the next closest off-site building, the church and commercial uses to the east of the project site, use of a vibratory roller would be expected to generate a PPV of 0.074 and a bulldozer would be expected to generate a PPV of 0.031. Use of either a vibratory roller or a bulldozer would not be considered annoying to receptors to the east.

At 60 feet, which is the distance to the closest commercial uses to the west of the project site, use of a vibratory roller would be expected to generate a PPV of 0.056 and a bulldozer would be expected to generate a PPV of 0.024. Use of either a vibratory roller or a bulldozer would not be considered annoying to receptors to the west.

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. Table 4 identifies a PPV levels between 0.4 and 0.6 as vibration levels greater than normally expected from traffic, but may cause "architectural" damage and possible minor structural damage.

The only receptor with the potential of architectural damage as a result of the construction of the proposed project would be the commercial building located approximately 10 feet north of the northern property line of the project site. Due to the proximity of the adjacent commercial building to the north, use of a vibratory roller within seven (7) feet of the northern property line that lies adjacent to the commercial office building to the north may result in architectural damage. Mitigation measures limiting the use of vibratory rollers and bulldozers along the northern property line would reduce potential impacts.

With incorporation of mitigation in Section 7 of this report, potential impacts would be reduced to less than significant levels.

c) *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

The proposed project is not located within two miles of an airport. Furthermore, the nearest airport to the project site is the Torrance Municipal Airport, located approximately 3.5 miles to the southwest of the proposed project site. Per the Los Angeles County Airport Land Use Commission (ALUC) the project site falls well outside of the Airport Influence Area for this airport. Therefore, aircraft noise associated with the Torrance Municipal Airport is not considered to be a source that contributes to the ambient noise levels on the project site. The proposed project would not expose persons residing or working within the area to excessive noise levels from aircraft. (Los Angeles County Airport Land Use Commission 2003)

Table 5 (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 5 (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 6
Construction Noise Levels (L_{eq})

Phase	Receptor Location	Existing Ambient Noise Levels[1] (Leq)	Unmitigated Construction Noise Levels[2] (Leq)	Combined Noise Levels (Leq)	Increase (dB)	Reduction with Mitigation[3] (dB)	Mitigated Construction Noise Levels (Leq)	Mitigated Existing Plus Construction Noise Levels (Leq)	Mitigated Increase in Ambient Noise Levels (Leq)
Demolition	North	57.7	74.0	74.1	16.4	10	64.0	64.9	7.2
	Northeast	52.3	77.5	77.5	25.2	10	67.5	67.6	15.3
	East	52.3	75.6	75.6	23.3	10	65.6	65.8	13.5
	West - Commercial	57.7	62.9	64.0	6.3	10	52.9	58.9	1.2
	West - Residential	66.4	61.5	67.6	1.2	10	51.5	66.5	0.1
Site Preparation	North	57.7	71.9	72.1	14.4	10	61.9	63.3	5.6
	Northeast	52.3	71.0	71.1	18.8	10	61.0	61.5	9.2
	East	52.3	66.9	67.0	14.7	10	56.9	58.2	5.9
	West - Commercial	57.7	66.8	67.3	9.6	10	56.8	60.3	2.6
	West - Residential	66.4	63.8	68.3	1.9	10	53.8	66.6	0.2
Grading	North	57.7	72.9	73.0	15.3	10	62.9	64.0	6.3
	Northeast	52.3	72.1	72.1	19.8	10	62.1	62.5	10.2
	East	52.3	67.9	68.0	15.7	10	57.9	59.0	6.7
	West - Commercial	57.7	67.8	68.2	10.5	10	57.8	60.8	3.1
	West - Residential	66.4	64.9	68.7	2.3	10	54.9	66.7	0.3
Building Construction	North	57.7	72.0	72.2	14.5	10	62.0	63.4	5.7
	Northeast	52.3	71.2	71.3	19.0	10	61.2	61.7	9.4
	East	52.3	67.0	67.1	14.8	10	57.0	58.3	6.0
	West - Commercial	57.7	66.9	67.4	9.7	10	56.9	60.3	2.6
	West - Residential	66.4	64.0	68.4	2.0	10	54.0	66.6	0.2
Paving	North	57.7	67.8	68.2	10.5	10	57.8	60.8	3.1
	Northeast	52.3	67.0	67.1	14.8	10	57.0	58.3	6.0
	East	52.3	62.8	63.2	10.9	10	52.8	55.6	3.3
	West - Commercial	57.7	62.7	63.9	6.2	10	52.7	58.9	1.2
	West - Residential	66.4	59.7	67.2	0.8	10	49.7	66.5	0.1
Architectural Coating	North	57.7	60.5	62.3	4.6	10	50.5	58.5	0.8
	Northeast	52.3	59.6	60.3	8.0	10	49.6	54.2	1.9
	East	52.3	55.4	57.1	4.8	10	45.4	53.1	0.8
	West - Commercial	57.7	55.4	59.7	2.0	10	45.4	57.9	0.2
	West - Residential	66.4	52.4	66.6	0.2	10	42.4	66.4	0.0

Notes:

(1) Per measured existing ambient noise levels. STNM1 was used for receptors to the northeast and east, STNM2 for the receptors to the north and the commercial receptors to the west, & STNM3 was used for the residential receptors to the west.

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

(3)This reduction can be verified by measuring on-site equipment or by special ordering mufflers to meet reduction requirement, or by providing sheilding/acoustic tent that provides a 20 dB reduction. See Appendix D.

Table 7
Project Average Daily Traffic Volumes and Roadway Parameters

Roadway	Segment	Average Daily Traffic Volume[1]		Posted Travel Speed (MPH)	Site Conditions
		Existing	Existing Plus Project		
182nd Street	Crenshaw Blvd to I-405 Northbound Ramps	27,800	28,400	35	Hard
	East of I-405 Northbound Ramps	15,500	15,800	35	Hard
190th Street	West of Crenshaw Blvd	33,200	33,300	45	Hard
	Crenshaw Blvd to Crenshaw Place	32,900	34,000	45	Hard
	Crenshaw Place to Project Dwy No. 1	33,200	34,200	45	Hard
	Project Dwy No. 1 to Project Dwy No. 2	32,700	33,500	45	Hard
	Project Dwy No. 2 to Van Ness Ave	32,600	33,500	45	Hard
	Van Ness Ave to I-405 Southbound Ramps	31,900	32,800	45	Hard
	I-405 Southbound Ramps to Western Ave	33,600	34,300	45	Hard
	East of Western Ave	28,500	28,600	45	Hard
Crenshaw Boulevard	North of 182nd St	27,500	27,800	40	Hard
	182nd St to I-405 Southbound Ramps	37,600	38,500	40	Hard
	I-405 Southbound Ramps to Crenshaw Place	44,200	45,500	40	Hard
	Crenshaw Place to 190th St	41,700	42,400	49	Hard
	South of 190th St	40,000	40,200	45	Hard
Van Ness Avenue	North of 190th St	20,200	20,400	35	Hard
	South of 190th St	19,000	19,100	35	Hard
Western Avenue	North of I-405 Northbound Ramps	27,400	27,500	45	Hard
	I-405 Northbound Ramps to 190th St	36,500	36,800	45	Hard
	South of 190th St	34,800	35,000	45	Hard
Crenshaw Place	Crenshaw Blvd to Project Dwy No. 3	400	900	25	Hard
	Project Dwy No. 3 to Project Dwy No. 4	1,400	1,500	25	Hard
	Project Dwy No. 4 to 190th St	1,400	1,500	25	Hard

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

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

Notes:

(1) Average daily traffic volumes calculated from the Existing and Project PM Peak Hour Traffic Volumes provided in the 2555 W. 190th Street Warehouse/Manufacturing Project Traffic Impact Analysis, Linscott Law & Greenspan Engineers. (July 29, 2019).

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

Table 8
Change in Existing Noise Levels Along Roadways as a Result of Project (dBA CNEL)

Roadway	Segment	Distance from roadway centerline to right-of-way (feet)[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
182nd Street	Crenshaw Blvd to I-405 Northbound Ramps	47	76.08	76.18	0.10	Yes	No
	East of I-405 Northbound Ramps	47	73.55	73.63	0.08	Yes	No
190th Street	West of Crenshaw Blvd	61	77.26	77.27	0.01	Yes	No
	Crenshaw Blvd to Crenshaw Place	61	77.22	77.36	0.14	Yes	No
	Crenshaw Place to Project Dwy No. 1	61	77.26	77.38	0.12	Yes	No
	Project Dwy No. 1 to Project Dwy No. 2	61	77.19	77.29	0.10	Yes	No
	Project Dwy No. 2 to Van Ness Ave	61	77.18	77.29	0.11	Yes	No
	Van Ness Ave to I-405 Southbound Ramps	61	77.08	77.20	0.12	Yes	No
	I-405 Southbound Ramps to Western Ave	61	77.31	77.40	0.09	Yes	No
	East of Western Ave	61	76.59	76.61	0.02	Yes	No
Crenshaw Boulevard	North of 182nd St	61	75.70	75.75	0.05	Yes	No
	182nd St to I-405 Southbound Ramps	61	77.06	77.16	0.10	Yes	No
	I-405 Southbound Ramps to Crenshaw Place	61	77.76	77.89	0.13	Yes	No
	Crenshaw Place to 190th St	61	77.51	77.58	0.07	Yes	No
	South of 190th St	61	78.06	78.09	0.03	Yes	No
Van Ness Avenue	North of 190th St	47	74.70	74.74	0.04	Yes	No
	South of 190th St	47	74.43	74.45	0.02	Yes	No
Western Avenue	North of I-405 Northbound Ramps	61	76.42	76.44	0.02	Yes	No
	I-405 Northbound Ramps to 190th St	61	77.67	77.70	0.03	Yes	No
	South of 190th St	61	77.46	77.48	0.02	Yes	No
Crenshaw Place	Crenshaw Blvd to Project Dwy No. 3	30	52.34	55.86	3.52	No	No
	Project Dwy No. 3 to Project Dwy No. 4	30	57.78	58.08	0.30	No	No
	Project Dwy No. 4 to 190th St	30	57.78	58.08	0.30	No	No

Notes:

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

(2) Distance from the roadway centerline to the roadway ROW. ROW distances were estimated based on the Road Cross Section Diagram, Figure CI-1, in the City of Torrance General Plan (April 2010).

(3) Per the City of Torrance normally acceptable standard for low-density residential dwelling units of 60 dBA CNEL (see Table 3).

Table 9
Comparison of Existing and Project Operational Noise Levels

Receiver Location[1]	Existing Measured Noise Levels	Proposed Project Operation	Project Generated Increase
1	52.3	54.9	2.6
2	57.7	61	3.3
3	66.4	54.2	0.0

Notes:

(1) Receiver locations and modeled operational noise levels are shown on Figure 6.

Table 10
Construction Equipment Vibration Source Levels

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

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

Figure 6
Operational Noise Levels Peak Hour

7. MEASURES TO REDUCE IMPACTS

CONSTRUCTION NOISE REDUCTION MEASURES

In addition to adherence to the City of Torrance 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.

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

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

7. Caution should be utilized if vibratory equipment such as vibratory rollers, or other similar vibratory equipment, are utilized within 16 feet or large bulldozers within five (5) feet of the portion of the northern property line that lies adjacent to the existing commercial building.

8. The use of vibratory equipment such vibratory rollers, or other similar vibratory equipment, is prohibited within seven (7) feet of the northern property line that lies adjacent to the existing commercial building.

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APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheet
Appendix D Construction Noise Calculations
Appendix E Project Generated Trips FHWA Worksheets
Appendix F SoundPLAN Input and Results
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 WORKSHEET

Noise Measurement
Field Data

Project Name: 190th Street Warehouse Project, City of Torrance **Date:** May 16, 2020

Project #: 19260

Noise Measurement #: STNM1 **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2549 West 190th Street, Torrance, California Run Time: (1 x 15 minutes)

Site Description (Type of Existing Land Use and any other notable features): Project site: Commercial building, asphalt parking lots, trees and planted areas.

Noise Measurement Site: Project Site to west, commercial parking lot/building to south, grass area to east, and grass area to north with commercial uses further north.

Weather: Slight high cloud, slightly filtered sun, otherwise clear skies. **Settings:** SLOW FAST

Temperature: 75 deg F **Wind:** 5-10mph **Humidity:** 49% **Terrain:** Flat

Start Time: 1:01 PM **End Time:** 1:16 PM **Run Time:**

Leq: 52.3 dB **Primary Noise Source:** Families enjoying the park/garden like area surrounding STNM1 location.

Lmax 61.5 dB

L2 57.6 dB **Secondary Noise Sources:** Traffic ambiance from 190th St (South), 405 Freeway (North) & Crenshaw Blvd

L8 54.6 dB (West). Overhead propeller aircraft. Bird song.

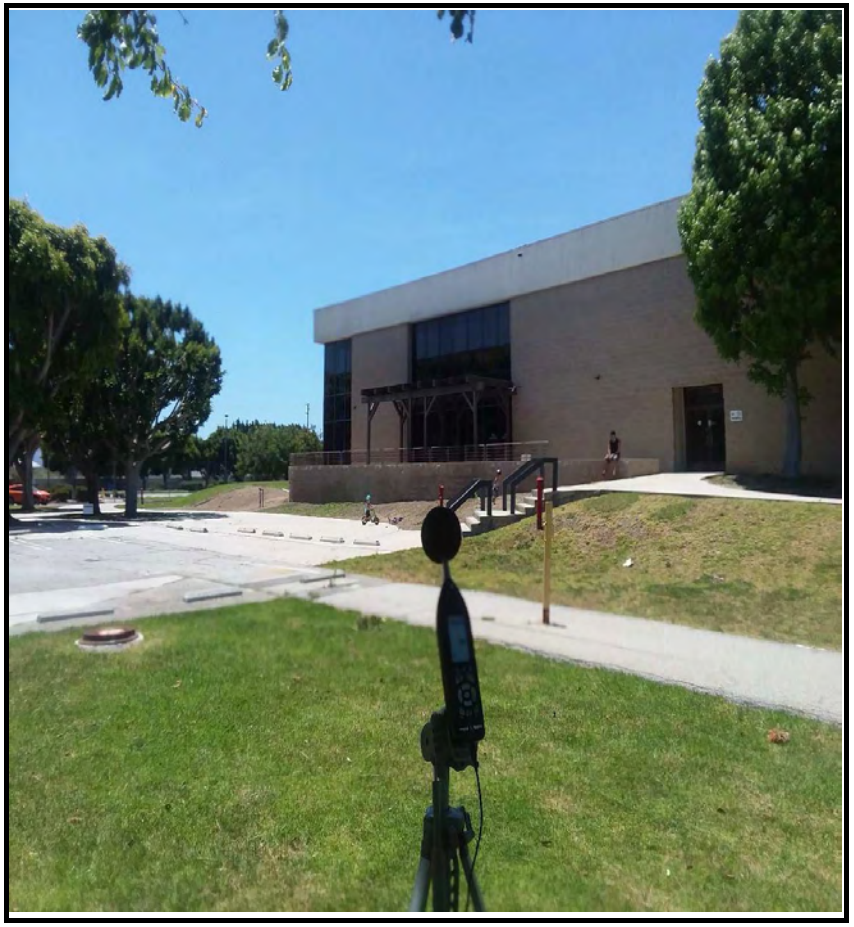
L25 52.3 dB

L50 51.3 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	5/16/2020		

Noise Measurement
Field Data

PHOTOS:



STNM1 looking SW towards SE corner of building, 2555 West 190th St, Torrance.

STNM1 (under tree) looking NW across park like area.

Summary					
File Name on Meter		LxT_Data.385			
File Name on PC	SLM_0003099_LxT_Data_385.00.ldbin				
Serial Number		0003099			
Model		SoundTrack LxT®			
Firmware Version		2.402			
User	Ian Edward Gallagher				
Location	STNM1 Ganddini JN 19260 33°51'35.04"N 1 18°19'22.69"W				
Job Description	15 minute noise measurement				
Measurement					
Start		2020-05-16 13:01:30			
Stop		2020-05-16 13:16:30			
Duration		00:15:00.0			
Run Time		00:15:00.0			
Pause		00:00:00.0			
Pre Calibration		2020-05-16 13:01:14			
Post Calibration		None			
Overall Settings					
RMS Weight		A Weighting			
Peak Weight		Z Weighting			
Detector		Slow			
Preamp		PRMLxT1L			
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		122.8 dB			
Results					
L_{Aeq}		52.3			
LAE		81.8			
EA		16.850 µPa²h			
EA8		539.208 µPa²h			
EA40		2.696 mPa²h			
$LZ_{peak\ (max)}$		2020-05-16 13:06:56	101.1 dB		
LAS_{max}		2020-05-16 13:08:20	61.5 dB		
LAS_{min}		2020-05-16 13:03:09	49.0 dB		
SEA		-99.9 dB			
				Statistics	
LC_{eq}		66.4 dB		**LAI2.00**	57.6 dB
LA_{eq}		52.3 dB		**LAI8.00**	54.6 dB
LC_{eq} - LA_{eq}		14.1 dB		**LAI25.00**	52.3 dB
LAI_{eq}		55.1 dB		**LAI50.00**	51.3 dB
LA_{eq}		52.3 dB		**LAI66.60**	50.8 dB
LAI_{eq} - LA_{eq}		2.8 dB		**LAI90.00**	50.0 dB
# Overloads		0			

Noise Measurement
Field Data

Project Name: 190th Street Warehouse Project, City of Torrance **Date:** May 16, 2020

Project #: 19260

Noise Measurement #: STNM2 **Technician:** Ian Gallagher

Nearest Address or Cross Street: 18801 Crenshaw Pl, Torrance, California Run Time: (1 x 15 minutes)

Site Description (Type of Existing Land Use and any other notable features): Project site: Commercial building, asphalt parking lots, trees and planted areas.

Noise Measurement Site: Commercial uses to west, Crenshaw Place to east, and project site further east.

Weather: Slight high cloud, slightly filtered sun, otherwise clear skies. **Settings:** SLOW FAST

Temperature: 75 deg F **Wind:** 5-10mph **Humidity:** 49% **Terrain:** Flat

Start Time: 1:57 PM **End Time:** 2:12 PM **Run Time:**

Leq: 57.7 dB **Primary Noise Source:** 11 vehicles passed microphone along Crenshaw Pl during 15 minute

Lmax 73.8 dB measurement.

L2 67.7 dB **Secondary Noise Sources:** Traffic ambiance from 190th St (South), 405 Freeway (North) & Crenshaw Blvd

L8 59.7 dB (West). Overhead propeller aircraft. Bird song. Breeze through palm leaves.

L25 54.5 dB

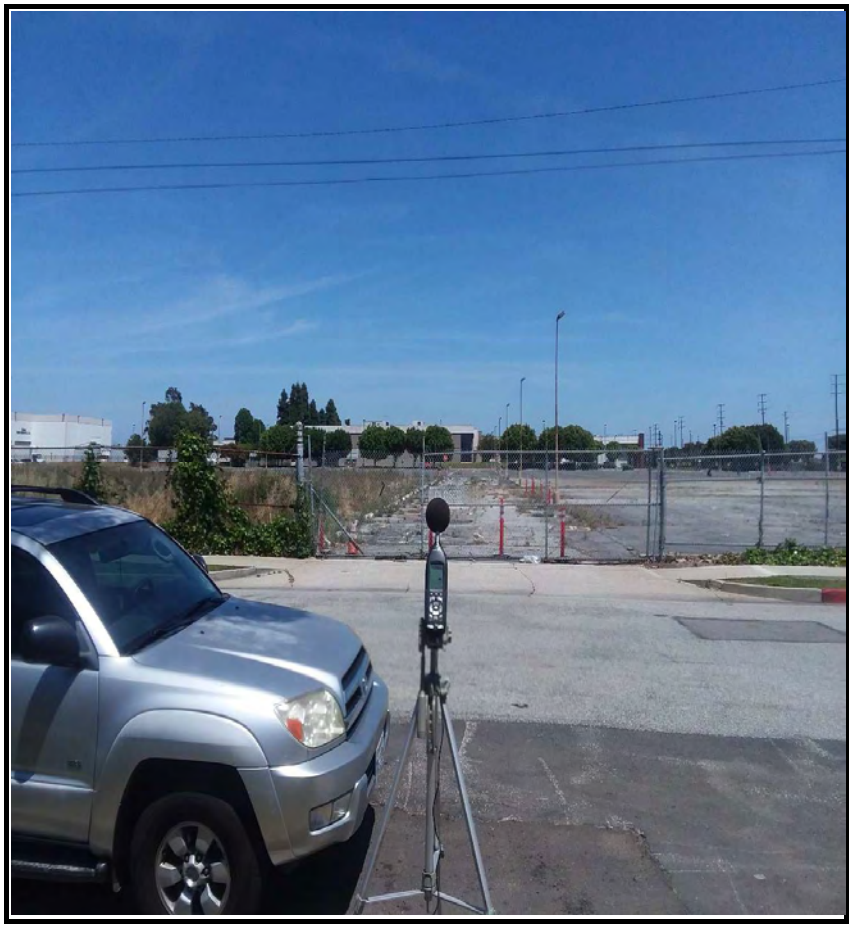
L50 52.5 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	5/16/2020		

gandini

Noise Measurement
Field Data

PHOTOS:



STNM2 looking East across Crenshaw Pl and parking lots towards building, 2555 West 190th Street, Torrance.

STNM2 looking NW towards building, 18801 Crenshaw Pl, Torrance.

Summary		
File Name on Meter	LxT_Data.387	
File Name on PC	SLM_0003099_LxT_Data_387.00.ldbin	
Serial Number	0003099	
Model	SoundTrack LxT®	
Firmware Version	2.402	
User	Ian Edward Gallagher	
Location	STNM2 Ganddini JN 19260 33°51'33.86"N 118°19'35.63"W	
Job Description	15 minute noise measurement (1 x 15 minutes)	

Measurement		
Start	2020-05-16 13:57:53	
Stop	2020-05-16 14:12:53	
Duration	00:15:00.0	
Run Time	00:15:00.0	
Pause	00:00:00.0	
Pre Calibration	2020-05-16 13:57:38	
Post Calibration	None	

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1L
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	122.7 dB

Results				
L_{Aeq}	57.7			
LAE	87.2			
EA	58.683 µPa²h			
EA8	1.878 mPa²h			
EA40	9.389 mPa²h			
$L_{Zpeak\ (max)}$	2020-05-16 14:03:36	102.7 dB		
L_{ASmax}	2020-05-16 14:03:53	73.8 dB		
L_{ASmin}	2020-05-16 14:08:24	48.7 dB		
SEA	-99.9 dB			

		Statistics	
L_{Ceq}	70.2 dB	**LAI2.00**	67.7 dB
L_{Aeq}	57.7 dB	**LAI8.00**	59.7 dB
L_{Ceq} - L_{Aeq}	12.6 dB	**LAI25.00**	54.5 dB
L_{AIeq}	59.6 dB	**LAI50.00**	52.5 dB
L_{Aeq}	57.7 dB	**LAI66.60**	51.7 dB
L_{AIeq} - L_{Aeq}	1.9 dB	**LAI90.00**	50.5 dB
# Overloads	0		

Noise Measurement
Field Data

Project Name: 190th Street Warehouse Project, City of Torrance **Date:** May 16, 2020

Project #: 19260

Noise Measurement #: STNM3 **Technician:** Ian Gallagher

Nearest Address or Cross Street: 18749 Crenshaw Boulevard, Torrance, California Run Time: (1 x 15 minutes)

Site Description (Type of Existing Land Use and any other notable features): Project site: Commercial building, asphalt parking lots, trees and planted areas.

Noise Measurement Site: Single-family residential dwelling unit to northwest, Church to southwest, Crenshaw Boulevard to east, and commercial use further north.

Weather: Slight high cloud, slightly filtered sun, otherwise clear skies. **Settings:** SLOW FAST

Temperature: 75 deg F **Wind:** 5-10mph **Humidity:** 49% **Terrain:** Flat

Start Time: 2:30 PM **End Time:** 2:45 PM **Run Time:**

Leq: 66.4 dB **Primary Noise Source:** 576 Vehicles passiedmicrophone along Crenshaw Blvd during 15 minute

Lmax 74.9 dB measurement.

L2 71.0 dB **Secondary Noise Sources:** Traffic ambiance from 190th St (South) & 405 Freeway (North).

L8 69.4 dB Overhead propeller aircraft. Bird song. Breeze through palm leaves.

L25 67.7 dB

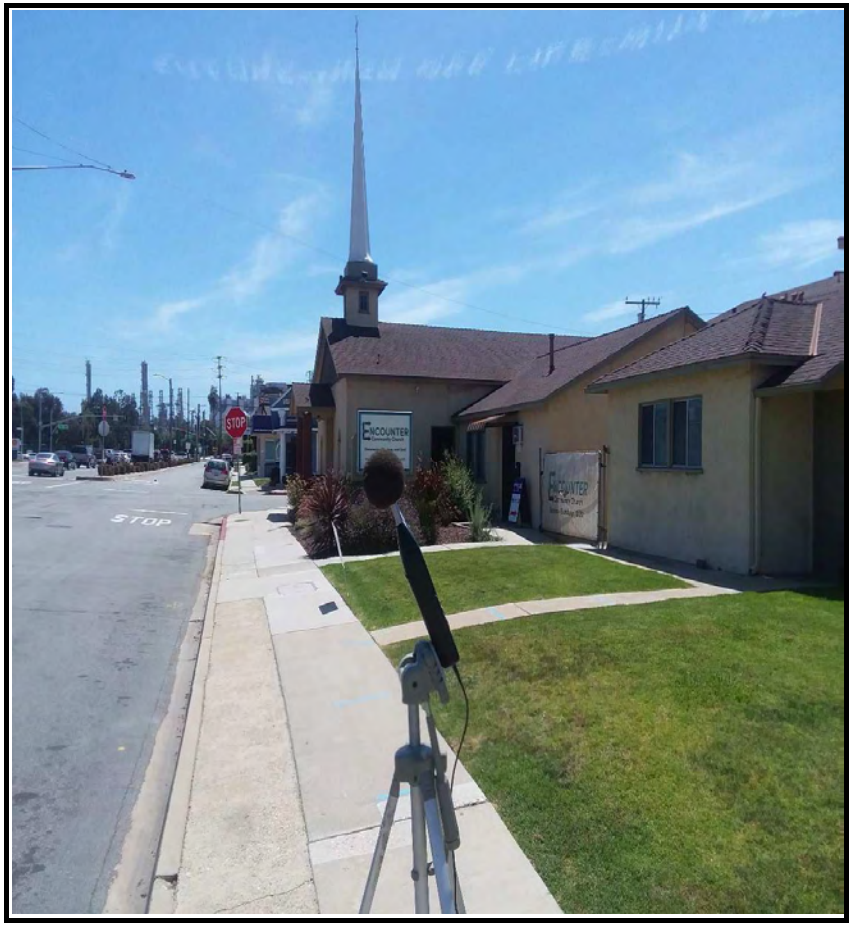
L50 65.7 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	5/16/2020		

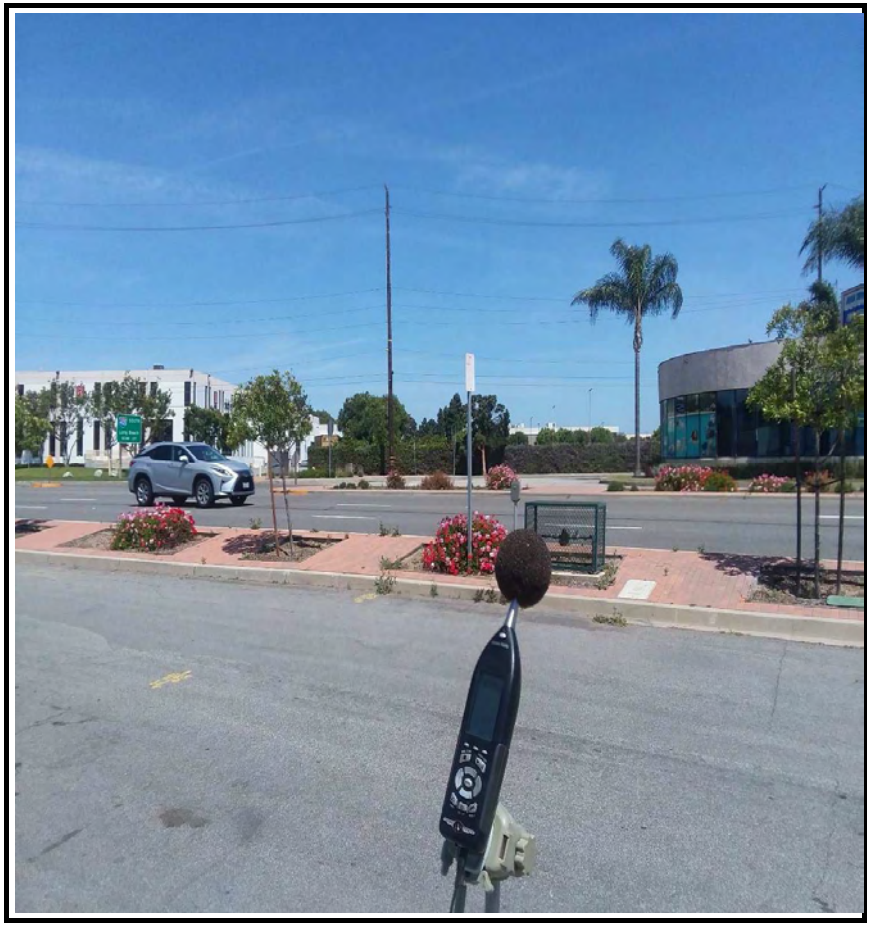
gandini

Noise Measurement
Field Data

PHOTOS:



STNM3 looking SW towards building, 18749 Crenshaw Blvd, Torrance.



STNM3 looking SE across Crenshaw Blvd towards building, 18750 Crenshaw Blvd, Torrance.

Summary				
File Name on Meter		LxT_Data.388		
File Name on PC	SLM_0003099_LxT_Data_388.00.ldbin			
Serial Number		0003099		
Model		SoundTrack LxT®		
Firmware Version		2.402		
User	Ian Edward Gallagher			
Location	STNM3 Ganddini JN 19260 33°51'36.04"N 118°19'37.77"W			
Job Description	15 minute noise measurement (1 x 15 minutes)			
Measurement				
Start		2020-05-16 14:30:12		
Stop		2020-05-16 14:45:12		
Duration		00:15:00.0		
Run Time		00:15:00.0		
Pause		00:00:00.0		
Pre Calibration		2020-05-16 14:27:53		
Post Calibration		None		
Overall Settings				
RMS Weight		A Weighting		
Peak Weight		Z Weighting		
Detector		Slow		
Preamp		PRMLxT1L		
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		122.7 dB		
Results				
LAeq		66.4		
LAE		95.9		
EA		434.644 µPa²h		
EA8		13.909 mPa²h		
EA40		69.543 mPa²h		
LZpeak (max)	2020-05-16	14:36:23	108.0 dB	
LASmax	2020-05-16	14:32:39	74.9 dB	
LASmin	2020-05-16	14:35:31	54.9 dB	
SEA		-99.9 dB		

		Statistics	
LCeq	75.5 dB	**LAI2.00**	71.0 dB
LAeq	66.4 dB	**LAI8.00**	69.4 dB
LCeq - LAeq	9.1 dB	**LAI25.00**	67.7 dB
LAIeq	67.1 dB	**LAI50.00**	65.7 dB
LAeq	66.4 dB	**LAI66.60**	64.0 dB
LAIeq - LAeq	0.7 dB	**LAI90.00**	60.2 dB
# Overloads	0		

Noise Measurement
Field Data

Project Name: 190th Street Warehouse Project, City of Torrance **Date:** May 16-17, 2020

Project #: 19260

Noise Measurement #: LTNM1 **Technician:** Ian Gallagher

Nearest Address or Cross Street: 2555 West 190th Street, Torrance, California Run Time: (15 x 1 hours)

Site Description (Type of Existing Land Use and any other notable features): Project site: Commercial building, asphalt parking lots, trees and planted areas.
Noise Measrement Site: Taken within project site, with existing commercial building to be demolished to NE, parking lots to be demolished surrounding measurement site to north, SE, west, and S, with 190th Street further south, commercial use further east, industrial & commercial uses further north, & Crenshaw Pl further west.

Weather: Slight high cloud, slightly filtered sun, otherwise clear skies. **Settings:** SLOW FAST

Temperature: 75-62 deg F **Wind:** 5-12mph **Humidity:** 49-70% **Terrain:** Flat

Start Time: 5:00 PM **End Time:** 8:02 AM **Run Time:**

Leq: 57.8 dB **Primary Noise Source:** Traffic ambiance from 190th St (South), 405 Freeway (North), Crenshaw Blvd

Lmax 72.7 dB (West) & other surrounding roads.

L2 62.6 dB **Secondary Noise Sources:** Overhead aircraft, bird song, breeze through leaves on trees.

L8 60.8 dB Parking lot activity from various people using empty parking lot.

L25 58.8 dB

L50 56.8 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	5/16/2020		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking at microphone disguised into bush.

LTNM1 looking E passed building, 2555 West 190th Street, Torrance, California.

Summary	
File Name on Meter	LxT_Data.389
File Name on PC	SLM_0003099_LxT_Data_389.00.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.402
User	Ian Edward Gallagher
Location	LTNM1 Ganddini JN 19260
Job Description	15 hour noise measurement (15 x 1 hours)

Measurement	
Start	2020-05-16 17:00:00
Stop	2020-05-17 17:00:00
Duration	15:02:39.1
Run Time	15:02:39.1
Pause	00:00:00.0
Pre Calibration	2020-05-16 15:56:36
Post Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
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	122.7 dB

Results			
L_{Aeq}	57.8		
LAE	105.1		
EA	3.598	mPa^2h	
EA8	1.913	mPa^2h	
EA40	9.567	mPa^2h	
$L_{Apeak\ (max)}$	2020-05-17 05:30:35	91.6	dB
L_{ASmax}	2020-05-16 19:10:46	72.7	dB
L_{ASmin}	2020-05-17 07:38:51	49.2	dB
SEA	-99.9	dB	

			Statistics	
L_{Ceq}	68.3	dB	**LAI2.00**	62.6 dB
L_{Aeq}	57.8	dB	**LAI8.00**	60.8 dB
L_{Ceq} - L_{Aeq}	10.6	dB	**LAI25.00**	58.8 dB
L_{AIeq}	58.4	dB	**LAI50.00**	56.8 dB
L_{Aeq}	57.8	dB	**LAI90.00**	52.9 dB
L_{AIeq} - L_{Aeq}	0.6	dB	**LAI99.00**	51.2 dB
# Overloads	0			

Record #	Date	Time	Run Duration	Run Time	Pause	LAeq	LAE	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2020-05-16	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.3	95.8	55.2	17:52:22	71.0	17:43:19	64.2	62.4	60.9	59.5	57.7	56.3
2	2020-05-16	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.1	95.7	54.9	18:52:43	72.3	18:26:21	64.0	62.6	60.8	59.4	57.3	56.2
3	2020-05-16	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	60.0	95.6	55.4	19:49:48	72.7	19:10:46	63.6	62.2	60.7	59.4	57.5	56.4
4	2020-05-16	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	59.3	94.8	55.1	20:28:19	67.3	20:32:19	63.0	61.6	60.0	58.6	56.9	55.8
5	2020-05-16	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	58.5	94.1	54.5	21:22:04	69.0	21:37:51	62.0	60.5	59.1	57.9	56.4	55.4
6	2020-05-16	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	59.4	95.0	54.2	22:59:06	72.2	22:42:32	62.5	61.3	60.1	59.1	56.2	55.0
7	2020-05-16	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	57.8	93.3	54.1	23:54:07	69.8	23:51:08	61.4	59.8	58.3	57.2	55.6	54.7
8	2020-05-17	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	57.1	92.7	53.6	00:58:46	65.0	00:31:02	60.7	59.1	57.5	56.6	55.3	54.3
9	2020-05-17	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	56.8	92.3	53.0	01:11:51	71.5	01:35:49	60.0	58.4	57.2	56.3	55.0	54.2
10	2020-05-17	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.8	90.4	51.8	02:14:11	61.2	02:08:34	58.7	56.7	55.3	54.1	52.9	52.3
11	2020-05-17	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.2	90.7	51.4	03:01:38	60.0	03:33:10	57.5	56.5	55.8	55.0	53.6	52.3
12	2020-05-17	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.2	89.7	49.6	04:58:29	69.7	04:53:24	57.6	56.3	54.7	53.0	51.4	50.2
13	2020-05-17	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.1	89.7	50.3	05:00:40	63.1	05:15:15	58.7	56.5	54.5	53.2	51.7	50.9
14	2020-05-17	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.5	91.1	51.2	06:05:48	69.3	06:47:01	60.3	58.2	55.9	54.4	52.5	51.7
15	2020-05-17	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.7	91.2	49.2	07:38:51	69.4	07:36:55	60.9	58.6	56.0	54.1	51.9	50.2
16	2020-05-17	08:00:00	00:02:39.0	00:02:39.0	00:00:00.0	55.4	77.4	50.4	08:00:25	62.0	08:02:34	61.2	59.2	56.4	53.3	50.9	50.5
17	2020-05-17	17:00:00	00:00:00.1	00:00:00.1	00:00:00.0	57.4	47.4	57.6	17:00:00	57.7	17:00:00	57.7	57.7	57.7	57.6	57.6	57.6

APPENDIX D

CONSTRUCTION NOISE CALCULATIONS

Receptor - Industrial to North

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1, 2]	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)
Demolition										
Concrete/Industrial Saws	1	90	240	20	0.20	76.4	69.4		59.4	
Excavators	3	85	240	40	0.4	71.4	67.4	Muffler (10 dB Reduction)	57.4	10.0
Rubber Tired Dozers	2	85	240	40	0.80	71.4	70.4	Muffler (10 dB Reduction)	60.4	
						Log Sum	74.0		64.0	
Site Preparation										
Tractors/Loaders/Backhoes	3	84	300	40	1.20	68.4	69.2	Muffler (10 dB Reduction)	59.2	
Rubber Tired Dozers	2	85	300	40	0.80	69.4	68.5	Muffler (10 dB Reduction)	58.5	10.0
						Log Sum	71.9		61.9	
Grading										
Excavators	2	85	300	40	0.4	69.4	65.5	Muffler (10 dB Reduction)	55.5	
Grader	1	85	300	40	0.40	69.4	65.5	Muffler (10 dB Reduction)	55.5	
Rubber Tired Dozers	1	85	300	40	0.40	69.4	65.5	Muffler (10 dB Reduction)	55.5	10.0
Scrapers	2	85	300	40	0.40	69.4	65.5	Muffler (10 dB Reduction)	55.5	
Tractors/Loaders/Backhoes	2	84	300	40	0.80	68.4	67.5	Muffler (10 dB Reduction)	57.5	
						Log Sum	72.9		62.9	
Building Construction										
Cranes	1	83	300	16	0.16	67.4	59.5	Muffler (10 dB Reduction)	49.5	
Forklifts [2]	4	64	300	40	1.60	48.4	50.5	n/a	50.5	
Generator Set	2	81	300	50	1.00	65.4	65.4	Enclosure or Acoustic Tent (10 dB Reduction)	55.4	9.1
Welders	1	74	300	40	0.40	58.4	54.5	n/a	54.5	
Tractors/Loaders/Backhoes	4	84	300	40	1.60	68.4	70.5	Muffler (10 dB Reduction)	60.5	
						Log Sum	72.0		62.9	
Paving										
Pavers	2	77	300	50	1.00	61.4	61.4	Muffler (10 dB Reduction)	51.4	
Paving Equipment	2	85	300	20	0.40	69.4	65.5	Muffler (10 dB Reduction)	55.5	10.0
Rollers	2	80	300	20	0.40	64.4	60.5	Muffler (10 dB Reduction)	50.5	
						Log Sum	67.8		57.8	
Architectural Coating										
Air Compressors	1	80	300	40	0.40	64.4	60.5	Enclosure or Acoustic Tent (10 dB Reduction)	50.5	10.0
						Log Sum	60.5		50.5	

Notes:

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

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(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 Northeast

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1, 2]	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)
Demolition										
Concrete/Industrial Saws	1	90	160	20	0.20	79.9	72.9		62.9	
Excavators	3	85	160	40	0.4	74.9	70.9	Muffler (10 dB Reduction)	60.9	10.0
Rubber Tired Dozers	2	85	160	40	0.80	74.9	73.9	Muffler (10 dB Reduction)	63.9	
						Log Sum	77.5		67.5	
Site Preparation										
Tractors/Loaders/Backhoes	3	84	330	40	1.20	67.6	68.4	Muffler (10 dB Reduction)	58.4	
Rubber Tired Dozers	2	85	330	40	0.80	68.6	67.6	Muffler (10 dB Reduction)	57.6	10.0
						Log Sum	71.0		61.0	
Grading										
Excavators	2	85	330	40	0.4	68.6	64.6	Muffler (10 dB Reduction)	54.6	
Grader	1	85	330	40	0.40	68.6	64.6	Muffler (10 dB Reduction)	54.6	
Rubber Tired Dozers	1	85	330	40	0.40	68.6	64.6	Muffler (10 dB Reduction)	54.6	10.0
Scrapers	2	85	330	40	0.40	68.6	64.6	Muffler (10 dB Reduction)	54.6	
Tractors/Loaders/Backhoes	2	84	330	40	0.80	67.6	66.6	Muffler (10 dB Reduction)	56.6	
						Log Sum	72.1		62.1	
Building Construction										
Cranes	1	83	330	16	0.16	66.6	58.7	Muffler (10 dB Reduction)	48.7	
Forklifts [2]	4	64	330	40	1.60	47.6	49.7	n/a	49.7	
Generator Set	2	81	330	50	1.00	64.6	64.6	Enclosure or Acoustic Tent (10 dB Reduction)	54.6	9.1
Welders	1	74	330	40	0.40	57.6	53.6	n/a	53.6	
Tractors/Loaders/Backhoes	4	84	330	40	1.60	67.6	69.7	Muffler (10 dB Reduction)	59.7	
						Log Sum	71.2		62.1	
Paving										
Pavers	2	77	330	50	1.00	60.6	60.6	Muffler (10 dB Reduction)	50.6	
Paving Equipment	2	85	330	20	0.40	68.6	64.6	Muffler (10 dB Reduction)	54.6	10.0
Rollers	2	80	330	20	0.40	63.6	59.6	Muffler (10 dB Reduction)	49.6	
						Log Sum	67.0		57.0	
Architectural Coating										
Air Compressors	1	80	330	40	0.40	63.6	59.6	Enclosure or Acoustic Tent (10 dB Reduction)	49.6	10.0
						Log Sum	59.6		49.6	

Notes:

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

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(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 East

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1, 2]	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)
Demolition										
Concrete/Industrial Saws	1	90	200	20	0.20	78.0	71.0		61.0	
Excavators	3	85	200	40	0.4	73.0	69.0	Muffler (10 dB Reduction)	59.0	10.0
Rubber Tired Dozers	2	85	200	40	0.80	73.0	72.0	Muffler (10 dB Reduction)	62.0	
						Log Sum	75.6		65.6	
Site Preparation										
Tractors/Loaders/Backhoes	3	84	535	40	1.20	63.4	64.2	Muffler (10 dB Reduction)	54.2	
Rubber Tired Dozers	2	85	535	40	0.80	64.4	63.4	Muffler (10 dB Reduction)	53.4	10.0
						Log Sum	66.9		56.9	
Grading										
Excavators	2	85	535	40	0.4	64.4	60.4	Muffler (10 dB Reduction)	50.4	
Grader	1	85	535	40	0.40	64.4	60.4	Muffler (10 dB Reduction)	50.4	
Rubber Tired Dozers	1	85	535	40	0.40	64.4	60.4	Muffler (10 dB Reduction)	50.4	10.0
Scrapers	2	85	535	40	0.40	64.4	60.4	Muffler (10 dB Reduction)	50.4	
Tractors/Loaders/Backhoes	2	84	535	40	0.80	63.4	62.4	Muffler (10 dB Reduction)	52.4	
						Log Sum	67.9		57.9	
Building Construction										
Cranes	1	83	535	16	0.16	62.4	54.5	Muffler (10 dB Reduction)	44.5	
Forklifts [2]	4	64	535	40	1.60	43.4	45.5	n/a	45.5	
Generator Set	2	81	535	50	1.00	60.4	60.4	Enclosure or Acoustic Tent (10 dB Reduction)	50.4	9.1
Welders	1	74	535	40	0.40	53.4	49.4	n/a	49.4	
Tractors/Loaders/Backhoes	4	84	535	40	1.60	63.4	65.5	Muffler (10 dB Reduction)	55.5	
						Log Sum	67.0		57.9	
Paving										
Pavers	2	77	535	50	1.00	56.4	56.4	Muffler (10 dB Reduction)	46.4	
Paving Equipment	2	85	535	20	0.40	64.4	60.4	Muffler (10 dB Reduction)	50.4	10.0
Rollers	2	80	535	20	0.40	59.4	55.4	Muffler (10 dB Reduction)	45.4	
						Log Sum	62.8		52.8	
Architectural Coating										
Air Compressors	1	80	535	40	0.40	59.4	55.4	Enclosure or Acoustic Tent (10 dB Reduction)	45.4	10.0
						Log Sum	55.4		45.4	

Notes:

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

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(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 West

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1, 2]	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)
Demolition										
Concrete/Industrial Saws	1	90	865	20	0.20	65.2	58.2		48.2	
Excavators	3	85	865	40	0.4	60.2	56.3	Muffler (10 dB Reduction)	46.3	10.0
Rubber Tired Dozers	2	85	865	40	0.80	60.2	59.3	Muffler (10 dB Reduction)	49.3	
						Log Sum	62.9		52.9	
Site Preparation										
Tractors/Loaders/Backhoes	3	84	540	40	1.20	63.3	64.1	Muffler (10 dB Reduction)	54.1	
Rubber Tired Dozers	2	85	540	40	0.80	64.3	63.4	Muffler (10 dB Reduction)	53.4	10.0
						Log Sum	66.8		56.8	
Grading										
Excavators	2	85	540	40	0.4	64.3	60.4	Muffler (10 dB Reduction)	50.4	
Grader	1	85	540	40	0.40	64.3	60.4	Muffler (10 dB Reduction)	50.4	
Rubber Tired Dozers	1	85	540	40	0.40	64.3	60.4	Muffler (10 dB Reduction)	50.4	10.0
Scrapers	2	85	540	40	0.40	64.3	60.4	Muffler (10 dB Reduction)	50.4	
Tractors/Loaders/Backhoes	2	84	540	40	0.80	63.3	62.4	Muffler (10 dB Reduction)	52.4	
						Log Sum	67.8		57.8	
Building Construction										
Cranes	1	83	540	16	0.16	62.3	54.4	Muffler (10 dB Reduction)	44.4	
Forklifts [2]	4	64	540	40	1.60	43.3	45.4	n/a	45.4	
Generator Set	2	81	540	50	1.00	60.3	60.3	Enclosure or Acoustic Tent (10 dB Reduction)	50.3	9.1
Welders	1	74	540	40	0.40	53.3	49.4	n/a	49.4	
Tractors/Loaders/Backhoes	4	84	540	40	1.60	63.3	65.4	Muffler (10 dB Reduction)	55.4	
						Log Sum	66.9		57.8	
Paving										
Pavers	2	77	540	50	1.00	56.3	56.3	Muffler (10 dB Reduction)	46.3	
Paving Equipment	2	85	540	20	0.40	64.3	60.4	Muffler (10 dB Reduction)	50.4	10.0
Rollers	2	80	540	20	0.40	59.3	55.4	Muffler (10 dB Reduction)	45.4	
						Log Sum	62.7		52.7	
Architectural Coating										
Air Compressors	1	80	540	40	0.40	59.3	55.4	Enclosure or Acoustic Tent (10 dB Reduction)	45.4	10.0
						Log Sum	55.4		45.4	

Notes:

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

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(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, 2]	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)
Demolition										
Concrete/Industrial Saws	1	90	1010	20	0.20	63.9	56.9		46.9	
Excavators	3	85	1010	40	0.4	58.9	54.9	Muffler (10 dB Reduction)	44.9	10.0
Rubber Tired Dozers	2	85	1010	40	0.80	58.9	57.9	Muffler (10 dB Reduction)	47.9	
						Log Sum	61.5		51.5	
Site Preparation										
Tractors/Loaders/Backhoes	3	84	760	40	1.20	60.4	61.2	Muffler (10 dB Reduction)	51.2	
Rubber Tired Dozers	2	85	760	40	0.80	61.4	60.4	Muffler (10 dB Reduction)	50.4	10.0
						Log Sum	63.8		53.8	
Grading										
Excavators	2	85	760	40	0.4	61.4	57.4	Muffler (10 dB Reduction)	47.4	
Grader	1	85	760	40	0.40	61.4	57.4	Muffler (10 dB Reduction)	47.4	
Rubber Tired Dozers	1	85	760	40	0.40	61.4	57.4	Muffler (10 dB Reduction)	47.4	10.0
Scrapers	2	85	760	40	0.40	61.4	57.4	Muffler (10 dB Reduction)	47.4	
Tractors/Loaders/Backhoes	2	84	760	40	0.80	60.4	59.4	Muffler (10 dB Reduction)	49.4	
						Log Sum	64.9		54.9	
Building Construction										
Cranes	1	83	760	16	0.16	59.4	51.4	Muffler (10 dB Reduction)	41.4	
Forklifts [2]	4	64	760	40	1.60	40.4	42.4	n/a	42.4	
Generator Set	2	81	760	50	1.00	57.4	57.4	Enclosure or Acoustic Tent (10 dB Reduction)	47.4	9.1
Welders	1	74	760	40	0.40	50.4	46.4	n/a	46.4	
Tractors/Loaders/Backhoes	4	84	760	40	1.60	60.4	62.4	Muffler (10 dB Reduction)	52.4	
						Log Sum	64.0		54.8	
Paving										
Pavers	2	77	760	50	1.00	53.4	53.4	Muffler (10 dB Reduction)	43.4	
Paving Equipment	2	85	760	20	0.40	61.4	57.4	Muffler (10 dB Reduction)	47.4	10.0
Rollers	2	80	760	20	0.40	56.4	52.4	Muffler (10 dB Reduction)	42.4	
						Log Sum	59.7		49.7	
Architectural Coating										
Air Compressors	1	80	760	40	0.40	56.4	52.4	Enclosure or Acoustic Tent (10 dB Reduction)	42.4	10.0
						Log Sum	52.4		42.4	

Notes:

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

(2) Source: https://www.google.com/url?q=http://www.noisetesting.info/blog/warehouse-forklift-workplace-noise-levels/&sa=D&source=hangouts&ust=1545259247311000&usg=AFQjCNHFcKKoEKUjv5VZMOtw_KO977Em1A

(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

Existing Traffic Noise

1	:Id	
182nd Street	:Road	
Crenshaw Boulevard to Interstate 405 Northbound Ramps	:Segment	

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

ADT	27800
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1610.01	33.36	55.60	1195.25	5.56	9.27	296.40	46.33	77.22
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	26.32	9.49	11.70	25.03	1.70	3.92	18.97	10.91	13.13
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.63	59.51	66.95	65.34	51.73	59.17	59.28	60.94	68.38
	DAY LEQ	70.19		EVENING LEQ	66.43		NIGHT LEQ	69.53	

F	CNEL	76.08	
	DAY LEQ	70.19	

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

Notes:

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

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

Existing Plus Project Traffic Noise

1	:Id
182nd Street	:Road
Crenshaw Boulevard to Interstate 405 Northbound Ramps	:Segment

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

ADT	28400
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1644.76	34.08	56.80	1221.05	5.68	9.47	302.79	47.33	78.89
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	26.41	9.58	11.80	25.12	1.80	4.02	19.06	11.01	13.22
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.72	59.61	67.04	65.43	51.82	59.26	59.37	61.03	68.47
	DAY LEQ	70.28		EVENING LEQ	66.52		NIGHT LEQ	69.62	

CNEL	76.18	Day hour	89.00
DAY LEQ	70.28	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

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

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

Existing Traffic Noise

2	:Id
182nd Street	:Road
East of Interstate 405 Northbound Ramps	:Segment

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

ADT	15500
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	897.67	18.60	31.00	666.42	3.10	5.17	165.26	25.83	43.06
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	23.78	6.95	9.17	22.49	-0.83	1.39	16.44	8.38	10.59
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	64.09	56.98	64.41	62.80	49.19	56.63	56.74	58.40	65.84
	DAY LEQ	67.65		EVENING LEQ	63.89		NIGHT LEQ	66.99	

CNEL	73.55
DAY LEQ	67.65

Day hour	90.00
Absorptive?	no
Use hour?	no
GRADE dB	1.00

Notes:

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

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

Existing Plus Project Traffic Noise

2	:Id
182nd Street	:Road
East of Interstate 405 Northbound Ramps	:Segment

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

ADT	15800
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	915.04	18.96	31.60	679.32	3.16	5.27	168.46	26.33	43.89
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	23.87	7.03	9.25	22.57	-0.75	1.47	16.52	8.46	10.68
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	64.18	57.06	64.50	62.88	49.28	56.71	56.83	58.49	65.92
	DAY LEQ	67.74		EVENING LEQ	63.97		NIGHT LEQ	67.07	

CNEL	73.63
DAY LEQ	67.74

Day hour	90.00
Absorptive?	no
Use hour?	no
GRADE dB	1.00

Notes:

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

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

Existing Traffic Noise

3	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	33200		
190th Street	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	45	
West of Crenshaw Boulevard	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	61	
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90	
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90	

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1922.74	39.84	66.40	1427.42	6.64	11.07	353.97	55.33	92.22
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.00	9.17	11.38	24.71	1.38	3.60	18.65	10.59	12.81
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.41	60.85	67.59	68.12	53.07	59.81	62.06	62.28	69.02
	DAY LEQ	71.96		EVENING LEQ	68.83		NIGHT LEQ	70.52	

CNEL	77.26	Day hour	91.00
DAY LEQ	71.96	Absorptive?	no
		Use hour?	no
		GRADE dB	2.00

Notes:

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

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

Existing Plus Project Traffic Noise

3	:Id	
190th Street	:Road	
West of Crenshaw Boulevard	:Segment	

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

ADT	33300
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1928.54	39.96	66.60	1431.72	6.66	11.10	355.04	55.50	92.50
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.01	9.18	11.40	24.72	1.40	3.62	18.66	10.60	12.82
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.43	60.87	67.60	68.13	53.09	59.82	62.08	62.29	69.03
	DAY LEQ	71.97		EVENING LEQ	68.85		NIGHT LEQ	70.53	

CNEL	77.27
DAY LEQ	71.97

Day hour	91.00
Absorptive?	no
Use hour?	no
GRADE dB	2.00

Notes:

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

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

Existing Traffic Noise

4	:Id
190th Street	:Road
Crenshaw Boulevard to Crenshaw Place	:Segment

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

ADT	32900
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1905.37	39.48	65.80	1414.52	6.58	10.97	350.77	54.83	91.39
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.96	9.13	11.34	24.67	1.34	3.56	18.61	10.55	12.77
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.37	60.81	67.55	68.08	53.03	59.77	62.02	62.24	68.98
	DAY LEQ	71.92		EVENING LEQ	68.79		NIGHT LEQ	70.48	

CNEL	77.22
DAY LEQ	71.92

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

Notes:

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

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

Existing Plus Project Traffic Noise

4	:Id
190th Street	:Road
Crenshaw Boulevard to Crenshaw Place	:Segment

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

ADT	34000
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1969.08	40.80	68.00	1461.82	6.80	11.33	362.50	56.67	94.44
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.10	9.27	11.49	24.81	1.49	3.71	18.76	10.70	12.91
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.52	60.96	67.70	68.22	53.18	59.91	62.17	62.38	69.12
	DAY LEQ	72.06		EVENING LEQ	68.94		NIGHT LEQ	70.62	

CNEL	77.36
DAY LEQ	72.06

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

Notes:

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

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

Existing Traffic Noise

5	:Id	
190th Street	:Road	
Crenshaw Place to Project Driveway No. 1	:Segment	

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

ADT	33200
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1922.74	39.84	66.40	1427.42	6.64	11.07	353.97	55.33	92.22
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.00	9.17	11.38	24.71	1.38	3.60	18.65	10.59	12.81
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.41	60.85	67.59	68.12	53.07	59.81	62.06	62.28	69.02
	DAY LEQ	71.96		EVENING LEQ	68.83		NIGHT LEQ	70.52	

CNEL	77.26
DAY LEQ	71.96

Day hour	93.00
Absorptive?	no
Use hour?	no
GRADE dB	4.00

Notes:

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

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

Existing Plus Project Traffic Noise

5	:Id	
190th Street	:Road	
Crenshaw Place to Project Driveway No. 1	:Segment	

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

ADT	34200
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1980.66	41.04	68.40	1470.42	6.84	11.40	364.63	57.00	95.00
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.13	9.29	11.51	24.84	1.51	3.73	18.78	10.72	12.94
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.54	60.98	67.72	68.25	53.20	59.94	62.19	62.41	69.15
	DAY LEQ	72.09		EVENING LEQ	68.96		NIGHT LEQ	70.65	

CNEL	77.38
DAY LEQ	72.09

Day hour	93.00
Absorptive?	no
Use hour?	no
GRADE dB	4.00

Notes:

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

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

Existing Traffic Noise

6	:Id
190th Street	:Road
Project Driveway No. 1 to Project Driveway No. 2	:Segment

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

ADT	32700
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1893.79	39.24	65.40	1405.93	6.54	10.90	348.64	54.50	90.83
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.94	9.10	11.32	24.64	1.32	3.54	18.59	10.53	12.74
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.35	60.79	67.53	68.05	53.01	59.74	62.00	62.21	68.95
	DAY LEQ	71.89		EVENING LEQ	68.77		NIGHT LEQ	70.46	

CNEL	77.19
DAY LEQ	71.89

Day hour	94.00
Absorptive?	no
Use hour?	no
GRADE dB	5.00

Notes:

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

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

Existing Plus Project Traffic Noise

6	:Id	
190th Street	:Road	
Project Driveway No. 1 to Project Driveway No. 2	:Segment	

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

ADT	33500
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1940.12	40.20	67.00	1440.32	6.70	11.17	357.17	55.83	93.06
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.04	9.20	11.42	24.75	1.42	3.64	18.69	10.63	12.85
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.45	60.89	67.63	68.16	53.11	59.85	62.10	62.32	69.06
	DAY LEQ	72.00		EVENING LEQ	68.87		NIGHT LEQ	70.56	

CNEL	77.29
DAY LEQ	72.00

Day hour	94.00
Absorptive?	no
Use hour?	no
GRADE dB	5.00

Notes:

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

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

Existing Traffic Noise

7	:Id
190th Street	:Road
Project Driveway No. 2 to Van Ness Avenue	:Segment

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

ADT	32600
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1888.00	39.12	65.20	1401.63	6.52	10.87	347.57	54.33	90.56
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.92	9.09	11.30	24.63	1.30	3.52	18.57	10.51	12.73
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.33	60.77	67.51	68.04	52.99	59.73	61.98	62.20	68.94
	DAY LEQ	71.88		EVENING LEQ	68.75		NIGHT LEQ	70.44	

CNEL	77.18
DAY LEQ	71.88

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

Notes:

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

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

Existing Plus Project Traffic Noise

7	:Id	
190th Street	:Road	
Project Driveway No. 2 to Van Ness Avenue	:Segment	

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

ADT	33500
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1940.12	40.20	67.00	1440.32	6.70	11.17	357.17	55.83	93.06
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.04	9.20	11.42	24.75	1.42	3.64	18.69	10.63	12.85
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.45	60.89	67.63	68.16	53.11	59.85	62.10	62.32	69.06
	DAY LEQ	72.00		EVENING LEQ	68.87		NIGHT LEQ	70.56	

CNEL	77.29
DAY LEQ	72.00

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

Notes:

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

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

Existing Traffic Noise

8	:Id	
190th Street	:Road	
Van Ness Avenue to Interstate 405 Southbound Ramps	:Segment	

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

ADT	31900
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1847.46	38.28	63.80	1371.53	6.38	10.63	340.11	53.17	88.61
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.83	8.99	11.21	24.53	1.21	3.43	18.48	10.42	12.64
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.24	60.68	67.42	67.95	52.90	59.64	61.89	62.11	68.84
	DAY LEQ	71.78		EVENING LEQ	68.66		NIGHT LEQ	70.35	

CNEL	77.08
DAY LEQ	71.78

Day hour	96.00
Absorptive?	no
Use hour?	no
GRADE dB	7.00

Notes:

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

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

Existing Plus Project Traffic Noise

8	:Id
190th Street	:Road
Van Ness Avenue to Interstate 405 Southbound Ramps	:Segment

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

ADT	32800
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1899.58	39.36	65.60	1410.23	6.56	10.93	349.71	54.67	91.11
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.95	9.11	11.33	24.65	1.33	3.55	18.60	10.54	12.76
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.36	60.80	67.54	68.07	53.02	59.76	62.01	62.23	68.97
	DAY LEQ	71.90		EVENING LEQ	68.78		NIGHT LEQ	70.47	

CNEL	77.20
DAY LEQ	71.90

Day hour	96.00
Absorptive?	no
Use hour?	no
GRADE dB	7.00

Notes:

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

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

Existing Traffic Noise

9	:Id
190th Street	:Road
Interstate 405 Southbound Ramps to Western Avenue	:Segment

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

ADT	33600
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1945.91	40.32	67.20	1444.62	6.72	11.20	358.24	56.00	93.33
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.05	9.22	11.44	24.76	1.44	3.65	18.70	10.64	12.86
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.46	60.91	67.64	68.17	53.12	59.86	62.11	62.33	69.07
	DAY LEQ	72.01		EVENING LEQ	68.89		NIGHT LEQ	70.57	

CNEL	77.31
DAY LEQ	72.01

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

Notes:

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

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

Existing Plus Project Traffic Noise

9	:Id
190th Street	:Road
Interstate 405 Southbound Ramps to Western Avenue	:Segment

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

ADT	34300
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1986.45	41.16	68.60	1474.72	6.86	11.43	365.70	57.17	95.28
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.14	9.31	11.53	24.85	1.53	3.74	18.79	10.73	12.95
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.55	61.00	67.73	68.26	53.21	59.95	62.20	62.42	69.16
	DAY LEQ	72.10		EVENING LEQ	68.97		NIGHT LEQ	70.66	

F	CNEL	77.40	
	DAY LEQ	72.10	

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

Notes:

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

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

Existing Traffic Noise

10	:Id	
190th Street	:Road	
East of Western Avenue	:Segment	

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

ADT	28500
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1650.55	34.20	57.00	1225.35	5.70	9.50	303.86	47.50	79.17
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.34	8.50	10.72	24.04	0.72	2.94	17.99	9.93	12.15
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.75	60.19	66.93	67.46	52.41	59.15	61.40	61.62	68.36
	DAY LEQ	71.29		EVENING LEQ	68.17		NIGHT LEQ	69.86	

CNEL	76.59
DAY LEQ	71.29

Day hour	98.00
Absorptive?	no
Use hour?	no
GRADE dB	9.00

Notes:

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

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

Existing Plus Project Traffic Noise

10	:Id
190th Street	:Road
East of Western Avenue	:Segment

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

ADT	28600
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1656.34	34.32	57.20	1229.65	5.72	9.53	304.93	47.67	79.44
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.35	8.52	10.74	24.06	0.74	2.95	18.00	9.94	12.16
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.76	60.21	66.94	67.47	52.42	59.16	61.41	61.63	68.37
	DAY LEQ	71.31		EVENING LEQ	68.19		NIGHT LEQ	69.87	

CNEL	76.61
DAY LEQ	71.31

Day hour	98.00
Absorptive?	no
Use hour?	no
GRADE dB	9.00

Notes:

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

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

Existing Traffic Noise

11	:Id	
Crenshaw Boulevard	:Road	
North of 182nd Street	:Segment	

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

ADT	27500
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1592.64	33.00	55.00	1182.35	5.50	9.17	293.20	45.83	76.39
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	25.69	8.86	11.08	24.40	1.08	3.30	18.35	10.29	12.50
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	67.12	59.24	66.30	65.83	51.46	58.52	59.77	60.66	67.73
	DAY LEQ	70.11		EVENING LEQ	66.70		NIGHT LEQ	69.05	

CNEL	75.70
DAY LEQ	70.11

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

Notes:

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

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

Existing Plus Project Traffic Noise

11	:Id
Crenshaw Boulevard	:Road
North of 182nd Street	:Segment

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

ADT	27800
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1610.01	33.36	55.60	1195.25	5.56	9.27	296.40	46.33	77.22
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	25.74	8.91	11.12	24.45	1.12	3.34	18.39	10.33	12.55
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	67.17	59.28	66.35	65.87	51.50	58.57	59.82	60.71	67.78
	DAY LEQ	70.16		EVENING LEQ	66.75		NIGHT LEQ	69.10	

CNEL	75.75
DAY LEQ	70.16

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

Notes:

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

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

Existing Traffic Noise

12	:Id
Crenshaw Boulevard	:Road
182nd Street to Interstate 405 Southbound Ramps	:Segment

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

ADT	37600
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2177.57	45.12	75.20	1616.60	7.52	12.53	400.88	62.67	104.44
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.05	10.22	12.44	25.76	2.44	4.65	19.70	11.64	13.86
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.48	60.60	67.66	67.19	52.81	59.88	61.13	62.02	69.09
	DAY LEQ	71.47		EVENING LEQ	68.06		NIGHT LEQ	70.41	

CNEL	77.06
DAY LEQ	71.47

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

Notes:

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

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

Existing Plus Project Traffic Noise

12	:Id
Crenshaw Boulevard	:Road
182nd Street to Interstate 405 Southbound Ramps	:Segment

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

ADT	38500
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2229.69	46.20	77.00	1655.29	7.70	12.83	410.48	64.17	106.94
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.16	10.32	12.54	25.86	2.54	4.76	19.81	11.75	13.97
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.58	60.70	67.76	67.29	52.92	59.98	61.23	62.13	69.19
	DAY LEQ	71.57		EVENING LEQ	68.16		NIGHT LEQ	70.52	

CNEL	77.16
DAY LEQ	71.57

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

Notes:

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

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

Existing Traffic Noise

13	:Id
Crenshaw Boulevard	:Road
Interstate 405 Southbound Ramps to Crenshaw Place	:Segment

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

ADT	44200
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2559.80	53.04	88.40	1900.36	8.84	14.73	471.25	73.67	122.78
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.76	10.92	13.14	26.46	3.14	5.36	20.41	12.35	14.56
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.18	61.30	68.36	67.89	53.52	60.58	61.83	62.73	69.79
	DAY LEQ	72.17		EVENING LEQ	68.76		NIGHT LEQ	71.12	

CNEL	77.76
DAY LEQ	72.17

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

Notes:

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

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

Existing Plus Project Traffic Noise

13	:Id
Crenshaw Boulevard	:Road
Interstate 405 Southbound Ramps to Crenshaw Place	:Segment

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

ADT	45500
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2635.09	54.60	91.00	1956.26	9.10	15.17	485.11	75.83	126.39
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.88	11.05	13.26	26.59	3.26	5.48	20.53	12.47	14.69
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.31	61.42	68.49	68.01	53.64	60.71	61.96	62.85	69.92
	DAY LEQ	72.30		EVENING LEQ	68.89		NIGHT LEQ	71.24	

CNEL	77.89
DAY LEQ	72.30

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

Notes:

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

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

Existing Traffic Noise

14	:Id
Crenshaw Boulevard	:Road
Crenshaw Place to 190th Street	:Segment

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

ADT	41700
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2415.01	50.04	83.40	1792.88	8.34	13.90	444.60	69.50	115.83
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.50	10.67	12.89	26.21	2.89	5.10	20.15	12.09	14.31
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.93	61.05	68.11	67.64	53.26	60.33	61.58	62.47	69.54
	DAY LEQ	71.92		EVENING LEQ	68.51		NIGHT LEQ	70.86	

CNEL	77.51
DAY LEQ	71.92

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

Notes:

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

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

Existing Plus Project Traffic Noise

14	:Id
Crenshaw Boulevard	:Road
Crenshaw Place to 190th Street	:Segment

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

ADT	42400
Speed	40
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2455.55	50.88	84.80	1822.97	8.48	14.13	452.06	70.67	117.78
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16
ADJUSTMENTS									
Flow	27.58	10.74	12.96	26.28	2.96	5.18	20.23	12.17	14.38
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.00	61.12	68.18	67.71	53.34	60.40	61.65	62.54	69.61
	DAY LEQ	71.99		EVENING LEQ	68.58		NIGHT LEQ	70.93	

CNEL	77.58
DAY LEQ	71.99

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

Notes:

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

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

Existing Traffic Noise

15	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	40000		
Crenshaw Boulevard	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	45	
South of 190th Street	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	61	
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90	
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90	

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2316.56	48.00	80.00	1719.79	8.00	13.33	426.47	66.67	111.11
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.81	9.97	12.19	25.52	2.19	4.41	19.46	11.40	13.62
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	70.22	61.66	68.40	68.93	53.88	60.62	62.87	63.09	69.83
	DAY LEQ	72.77		EVENING LEQ	69.64		NIGHT LEQ	71.33	

CNEL	78.06	Day hour	0.00
DAY LEQ	72.77	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

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

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

Existing Plus Project Traffic Noise

15	:Id
Crenshaw Boulevard	:Road
South of 190th Street	:Segment

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

ADT	40200
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2328.14	48.24	80.40	1728.39	8.04	13.40	428.60	67.00	111.67
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.83	10.00	12.21	25.54	2.21	4.43	19.48	11.42	13.64
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	70.24	61.68	68.42	68.95	53.90	60.64	62.89	63.11	69.85
	DAY LEQ	72.79		EVENING LEQ	69.66		NIGHT LEQ	71.35	

CNEL	78.09
DAY LEQ	72.79

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

Notes:

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

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

Existing Traffic Noise

16	:Id	
Van Ness Avenue	:Road	
North of 190th Street	:Segment	

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

ADT	20200
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1169.86	24.24	40.40	868.49	4.04	6.73	215.37	33.67	56.11
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	24.93	8.10	10.32	23.64	0.32	2.54	17.59	9.53	11.74
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	65.24	58.13	65.56	63.95	50.34	57.78	57.89	59.55	66.99
	DAY LEQ	68.80		EVENING LEQ	65.04		NIGHT LEQ	68.14	

CNEL	74.70
DAY LEQ	68.80

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

Notes:

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

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

Existing Plus Project Traffic Noise

16	:Id
Van Ness Avenue	:Road
North of 190th Street	:Segment

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

ADT	20400
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1181.45	24.48	40.80	877.09	4.08	6.80	217.50	34.00	56.67
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	24.98	8.14	10.36	23.68	0.36	2.58	17.63	9.57	11.79
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	65.29	58.17	65.60	63.99	50.39	57.82	57.94	59.60	67.03
	DAY LEQ	68.85		EVENING LEQ	65.08		NIGHT LEQ	68.18	

CNEL	74.74
DAY LEQ	68.85

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

Notes:

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

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

Existing Traffic Noise

17	:Id
Van Ness Avenue	:Road
South of 190th Street	:Segment

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

ADT	19000
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1100.37	22.80	38.00	816.90	3.80	6.33	202.57	31.67	52.78
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	24.67	7.83	10.05	23.38	0.05	2.27	17.32	9.26	11.48
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	64.98	57.86	65.30	63.68	50.08	57.51	57.63	59.29	66.72
	DAY LEQ	68.54		EVENING LEQ	64.77		NIGHT LEQ	67.87	

CNEL	74.43
DAY LEQ	68.54

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

Notes:

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

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

Existing Plus Project Traffic Noise

17	:Id
Van Ness Avenue	:Road
South of 190th Street	:Segment

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

ADT	19100
Speed	35
Distance	47
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1106.16	22.92	38.20	821.20	3.82	6.37	203.64	31.83	53.06
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	24.69	7.86	10.07	23.40	0.07	2.29	17.34	9.28	11.50
Distance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	65.00	57.88	65.32	63.71	50.10	57.54	57.65	59.31	66.75
	DAY LEQ	68.56		EVENING LEQ	64.80		NIGHT LEQ	67.90	

CNEL	74.45
DAY LEQ	68.56

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

Notes:

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

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

Existing Traffic Noise

18	:Id
Western Avenue	:Road
North of Interstate 405 Northbound Ramps	:Segment

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

ADT	27400
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1586.84	32.88	54.80	1178.05	5.48	9.13	292.13	45.67	76.11
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.17	8.33	10.55	23.87	0.55	2.77	17.82	9.76	11.98
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.58	60.02	66.76	67.28	52.24	58.98	61.23	61.45	68.18
	DAY LEQ	71.12		EVENING LEQ	68.00		NIGHT LEQ	69.69	

CNEL	76.42
DAY LEQ	71.12

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

Notes:

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

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

Existing Plus Project Traffic Noise

18	:Id
Western Avenue	:Road
North of Interstate 405 Northbound Ramps	:Segment

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

ADT	27500
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1592.64	33.00	55.00	1182.35	5.50	9.17	293.20	45.83	76.39
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	25.18	8.35	10.57	23.89	0.57	2.78	17.83	9.77	11.99
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.59	60.04	66.77	67.30	52.25	58.99	61.24	61.46	68.20
	DAY LEQ	71.14		EVENING LEQ	68.02		NIGHT LEQ	69.70	

CNEL	76.44
DAY LEQ	71.14

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

Notes:

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

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

Existing Traffic Noise

19	:Id
Western Avenue	:Road
Interstate 405 Northbound Ramps to 190th Street	:Segment

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

ADT	36500
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2113.86	43.80	73.00	1569.31	7.30	12.17	389.15	60.83	101.39
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.41	9.58	11.80	25.12	1.80	4.01	19.06	11.00	13.22
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.82	61.27	68.00	68.53	53.48	60.22	62.47	62.69	69.43
	DAY LEQ	72.37		EVENING LEQ	69.24		NIGHT LEQ	70.93	

CNEL	77.67
DAY LEQ	72.37

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

Notes:

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

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

Existing Plus Project Traffic Noise

19	:Id
Western Avenue	:Road
Interstate 405 Northbound Ramps to 190th Street	:Segment

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

ADT	36800
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2131.24	44.16	73.60	1582.20	7.36	12.27	392.35	61.33	102.22
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.45	9.61	11.83	25.15	1.83	4.05	19.10	11.04	13.26
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.86	61.30	68.04	68.57	53.52	60.26	62.51	62.73	69.47
	DAY LEQ	72.40		EVENING LEQ	69.28		NIGHT LEQ	70.97	

CNEL	77.70
DAY LEQ	72.40

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

Notes:

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

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

Existing Traffic Noise

20	:Id	
Western Avenue	:Road	
South of 190th Street	:Segment	

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

ADT	34800
Speed	45
Distance	61
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2015.41	41.76	69.60	1496.21	6.96	11.60	371.03	58.00	96.67
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.21	9.37	11.59	24.91	1.59	3.81	18.86	10.80	13.01
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.62	61.06	67.80	68.32	53.28	60.01	62.27	62.48	69.22
	DAY LEQ	72.16		EVENING LEQ	69.04		NIGHT LEQ	70.73	

CNEL	**77.46**
DAY LEQ	72.16

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

Notes:

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

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

Existing Plus Project Traffic Noise

20	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	35000
Western Avenue	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	45
South of 190th Street	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	61
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	2026.99	42.00	70.00	1504.81	7.00	11.67	373.16	58.33	97.22
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	26.23	9.39	11.61	24.94	1.61	3.83	18.88	10.82	13.04
Distance	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93	-0.93
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	69.64	61.08	67.82	68.35	53.30	60.04	62.29	62.51	69.25
	DAY LEQ	72.19		EVENING LEQ	69.06		NIGHT LEQ	70.75	

CNEL	77.48	Day hour	0.00
DAY LEQ	72.19	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

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

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

Existing Traffic Noise

21	:Id	
Crenshaw Place	:Road	
Crenshaw Boulevard to Project Driveway No. 3	:Segment	

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

ADT	400
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	24.53	0.30	0.12	18.13	0.05	0.05	4.54	0.40	0.16
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	9.61	-9.51	-13.62	8.30	-17.02	-17.01	2.29	-8.26	-12.37
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	46.20	38.72	40.77	44.89	31.21	37.38	38.87	39.97	42.02
	DAY LEQ	47.86		EVENING LEQ	45.75		NIGHT LEQ	45.26	

CNEL	52.34
DAY LEQ	47.86

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

Notes:

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

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

Existing Plus Project Traffic Noise

21	:Id
Crenshaw Place	:Road
Crenshaw Boulevard to Project Driveway No. 3	:Segment

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

ADT	900
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	55.20	0.67	0.26	40.79	0.12	0.12	10.22	0.90	0.35
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	13.13	-5.99	-10.09	11.82	-13.50	-13.49	5.81	-4.74	-8.84
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.72	42.24	44.30	48.41	34.73	40.90	42.40	43.49	45.54
	DAY LEQ	51.38		EVENING LEQ	49.27		NIGHT LEQ	48.78	

CNEL	55.86
DAY LEQ	51.38

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

Notes:

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

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

Existing Traffic Noise

22	:Id	
Crenshaw Place	:Road	
Project Driveway No. 3 to Project Driveway No. 4	:Segment	

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

ADT	1400
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	85.86	1.05	0.41	63.45	0.19	0.19	15.89	1.40	0.54
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.05	-4.07	-8.17	13.74	-11.58	-11.57	7.73	-2.82	-6.93
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.64	44.16	46.21	50.33	36.65	42.82	44.32	45.41	47.46
	DAY LEQ	53.30		EVENING LEQ	51.19		NIGHT LEQ	50.70	

CNEL	57.78
DAY LEQ	53.30

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

Notes:

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

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

Existing Plus Project Traffic Noise

22	:Id
Crenshaw Place	:Road
Project Driveway No. 3 to Project Driveway No. 4	:Segment

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

ADT	1500
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	91.99	1.12	0.44	67.99	0.20	0.20	17.03	1.50	0.58
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.35	-3.77	-7.88	14.04	-11.28	-11.27	8.03	-2.52	-6.63
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.94	44.46	46.51	50.63	36.95	43.12	44.62	45.71	47.76
	DAY LEQ	53.60		EVENING LEQ	51.49		NIGHT LEQ	51.00	

CNEL	58.08
DAY LEQ	53.60

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

Notes:

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

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

Existing Traffic Noise

23	:Id	
Crenshaw Place	:Road	
Project Driveway No. 4 to 190th Street	:Segment	

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

ADT	1400
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	85.86	1.05	0.41	63.45	0.19	0.19	15.89	1.40	0.54
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.05	-4.07	-8.17	13.74	-11.58	-11.57	7.73	-2.82	-6.93
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.64	44.16	46.21	50.33	36.65	42.82	44.32	45.41	47.46
	DAY LEQ	53.30		EVENING LEQ	51.19		NIGHT LEQ	50.70	

CNEL	57.78
DAY LEQ	53.30

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

Notes:

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

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

Existing Plus Project Traffic Noise

23	:Id
Crenshaw Place	:Road
Project Driveway No. 4 to 190th Street	:Segment

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

ADT	1500
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	91.99	1.12	0.44	67.99	0.20	0.20	17.03	1.50	0.58
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.35	-3.77	-7.88	14.04	-11.28	-11.27	8.03	-2.52	-6.63
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.94	44.46	46.51	50.63	36.95	43.12	44.62	45.71	47.76
	DAY LEQ	53.60		EVENING LEQ	51.49		NIGHT LEQ	51.00	

CNEL	58.08
DAY LEQ	53.60

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

Notes:

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

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

FHWA Traffic Noise Prediction Model FHWA-RD-77-108
Riverside County Published Mix
Larger than Secondary

Buildout Traffic Noise

190th Street - at closest portion proposed industrial building

	DAYTIME			EVENING			NIGHTTIME				
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	ADT	40500.00
							AUTOS			SPEED	45.00
										DISTANCE	135.00
INPUT PARAMETERS											
Vehicles per hour	2345.52	48.60	81.00	1741.28	8.10	13.50	431.80	67.50	112.50	% A	92.00
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% 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	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	CNEL	74.67
ADJUSTMENTS										DAY LEQ	69.37
Flow	26.86	10.03	12.25	25.57	2.25	4.47	19.51	11.46	13.67		
Distance	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	-4.38	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	66.83	58.27	65.00	65.53	50.49	57.22	59.48	59.69	66.43	GRADE dB	0.00

DAY LEQ	69.37	EVENING LEQ	66.25	NIGHT LEQ	67.93	
CNEL	**74.67**					

APPENDIX F

SOUNDPLAN INPUT AND RESULTS

Noise emissions of industry sources

Source na	Referen		Level	Frequency spectrum [dB(A)]																										Correctio		
				31	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1	1.3	1.6	2	2.5	3.2	4	5	6.3	8	10	12.5	16	Cwa	Cl	CT
			dB(A	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	dB	dB	dB
1	Lw/m²	Day	80.0	-	-	-	47.	50.	54.	57.	59.	61.	64.	66.	68.	70.	71.	72.	73.	73.	73.	74.	74.	74.	74.	73.	73.	72.	-	-	-	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lw/unit	Day	67.3	-19.	-10.	6.8	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	56.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Lw/unit	Day	67.3	-19.	-10.	6.8	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	56.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Lw/unit	Day	67.3	-19.	-10.	6.8	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	56.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-

Noise emissions of industry sources

Source na	Referen	Level		Frequency spectrum [dB(A)]																											Correctio		
			dB(A	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.3 kHz	1.6 kHz	2 kHz	2.5 kHz	3.2 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	Cwa dB	Cl dE	CT dB
32		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	Lw/unit	Day	67.3	-19.	-10.	6.	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Noise emissions of industry sources

Source na	Referen	Level		Frequency spectrum [dB(A)]																										Correctio		
			dB(A	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.3 kHz	1.6 kHz	2 kHz	2.5 kHz	3.2 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	Cwa dB	Cl dE	CT dB
65	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	Lw/unit	Day	67.3	-19.	-10.	6.1	15.	13.	27.	32.	34.	39.	41.	45.	48.	50.	56.	58.	55.	57.	59.	57.	58.	55.	55.	53.	52.	46.	40.	36.1	30.	-	-	-
		Nigh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour		Road surface	Separated method	Lw,ref
			Day	Night			dB(A)
1	Visitors and staff	166 Parking bays	3.200	0.000	Asphaltic driving lanes	no	90.7
2	Visitors and staff	54 Parking bays	3.200	0.000	Asphaltic driving lanes	no	84.5
3	Visitors and staff	60 Parking bays	3.200	0.000	Asphaltic driving lanes	no	85.1
4	Visitors and staff	160 Parking bays	3.200	0.000	Asphaltic driving lanes	no	90.5
5	Visitors and staff	27 Parking bays	3.200	0.000	Asphaltic driving lanes	no	80.5
6	Visitors and staff	4 Parking bays	3.200	0.000	Asphaltic driving lanes	no	69.0
7	Visitors and staff	35 Parking bays	3.200	0.000	Asphaltic driving lanes	no	82.0
8	Visitors and staff	32 Parking bays	3.200	0.000	Asphaltic driving lanes	no	81.5
9	Visitors and staff	166 Parking bays	3.200	0.000	Asphaltic driving lanes	no	90.7

Receiver list

No.	Receiver name	Building side	Floor	Limit		Level w/o NP		Level w NP		Difference		Conflict
				Day	Night	Day	Night	Day	Night	Day	Night	Day
				dB(A)		dB(A)		dB(A)		dB		dB
1	1	-	GF	-	-	54.9	0.0	0.0	0.0	-54.9	0.0	-
2	2	-	GF	-	-	61.0	0.0	0.0	0.0	-61.0	0.0	-
3	3	-	GF	-	-	54.2	0.0	0.0	0.0	-54.2	0.0	-

Contribution levels of the receivers

Source name				Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
				dB(A)		dB(A)	
1	GF	54.9	0.0	0.0	0.0		
1				34.4	-	-	-
1				33.7	-	-	-
1				-2.6	-	-	-
2				30.2	-	-	-
2				-2.1	-	-	-
3				40.9	-	-	-
3				-1.5	-	-	-
4				49.3	-	-	-
4				-1.0	-	-	-
5				42.2	-	-	-
5				-0.1	-	-	-
6				37.3	-	-	-
6				0.7	-	-	-
7				1.6	-	-	-
7				50.5	-	-	-
8				48.1	-	-	-
8				2.7	-	-	-
9				5.1	-	-	-
9				34.3	-	-	-
10				8.0	-	-	-
11				13.3	-	-	-
12				14.0	-	-	-
13				12.3	-	-	-
14				7.5	-	-	-
15				4.0	-	-	-
16				3.4	-	-	-
17				2.6	-	-	-
18				1.5	-	-	-
19				0.6	-	-	-
20				-0.2	-	-	-
21				-1.0	-	-	-
22				-1.7	-	-	-
23				-2.2	-	-	-
24				-2.8	-	-	-
25				-2.8	-	-	-
26				-2.3	-	-	-
27				-1.7	-	-	-
28				-1.1	-	-	-
29				-0.7	-	-	-
30				-0.6	-	-	-
31				-0.4	-	-	-
32				-0.1	-	-	-
33				0.5	-	-	-
34				2.4	-	-	-
35				7.2	-	-	-
36				11.6	-	-	-
37				10.5	-	-	-
38				6.5	-	-	-
39				2.1	-	-	-
40				0.2	-	-	-
41				-1.7	-	-	-
42				-2.3	-	-	-
43				-2.5	-	-	-
44				-2.6	-	-	-
45				-2.8	-	-	-
46				-2.9	-	-	-
47				-2.9	-	-	-
48				-3.0	-	-	-
49				-4.5	-	-	-
50				-4.5	-	-	-
51				-4.4	-	-	-
52				-4.3	-	-	-
53				-4.1	-	-	-

Contribution levels of the receivers

Source name				Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
				dB(A)		dB(A)	
54				-3.6	-	-	-
55				-2.8	-	-	-
56				-1.9	-	-	-
57				0.0	-	-	-
58				1.8	-	-	-
59				6.1	-	-	-
60				10.0	-	-	-
61				9.4	-	-	-
62				5.7	-	-	-
63				1.5	-	-	-
64				-0.2	-	-	-
65				-2.0	-	-	-
66				-2.9	-	-	-
67				-3.7	-	-	-
68				-4.4	-	-	-
69				-5.1	-	-	-
70				-5.7	-	-	-
71				-5.8	-	-	-
72				-6.0	-	-	-
2	GF	61.0	0.0	0.0	0.0		
1				60.1	-	-	-
1				6.3	-	-	-
1				11.6	-	-	-
2				53.1	-	-	-
2				7.6	-	-	-
3				41.4	-	-	-
3				5.1	-	-	-
4				38.3	-	-	-
4				3.3	-	-	-
5				21.2	-	-	-
5				1.6	-	-	-
6				7.6	-	-	-
6				0.3	-	-	-
7				-0.7	-	-	-
7				13.1	-	-	-
8				14.4	-	-	-
8				-1.6	-	-	-
9				-3.0	-	-	-
9				41.3	-	-	-
10				-3.9	-	-	-
11				-5.0	-	-	-
12				-5.5	-	-	-
13				-5.6	-	-	-
14				-5.0	-	-	-
15				-3.9	-	-	-
16				-3.0	-	-	-
17				-1.6	-	-	-
18				-0.7	-	-	-
19				0.4	-	-	-
20				1.6	-	-	-
21				3.2	-	-	-
22				5.1	-	-	-
23				7.6	-	-	-
24				11.6	-	-	-
25				11.6	-	-	-
26				7.5	-	-	-
27				5.0	-	-	-
28				3.2	-	-	-
29				1.5	-	-	-
30				0.3	-	-	-
31				-0.7	-	-	-
32				-1.6	-	-	-
33				-3.0	-	-	-
34				-3.9	-	-	-

Contribution levels of the receivers

Source name				Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
				dB(A)		dB(A)	
35				-5.1	-	-	-
36				-5.6	-	-	-
37				-5.5	-	-	-
38				-5.0	-	-	-
39				-3.9	-	-	-
40				-3.0	-	-	-
41				-1.7	-	-	-
42				-0.7	-	-	-
43				0.4	-	-	-
44				1.6	-	-	-
45				3.2	-	-	-
46				5.0	-	-	-
47				7.7	-	-	-
48				11.4	-	-	-
49				11.4	-	-	-
50				7.2	-	-	-
51				4.8	-	-	-
52				3.0	-	-	-
53				1.5	-	-	-
54				0.3	-	-	-
55				-0.8	-	-	-
56				-1.7	-	-	-
57				-3.0	-	-	-
58				-3.9	-	-	-
59				-5.0	-	-	-
60				-5.6	-	-	-
61				-5.6	-	-	-
62				-5.1	-	-	-
63				-3.9	-	-	-
64				-3.0	-	-	-
65				-1.7	-	-	-
66				-0.8	-	-	-
67				0.2	-	-	-
68				1.3	-	-	-
69				2.8	-	-	-
70				4.5	-	-	-
71				6.9	-	-	-
72				10.4	-	-	-
3	GF	54.2	0.0	0.0	0.0		
1				51.8	-	-	-
1				26.1	-	-	-
1				10.4	-	-	-
2				46.2	-	-	-
2				8.6	-	-	-
3				42.2	-	-	-
3				7.0	-	-	-
4				46.8	-	-	-
4				6.3	-	-	-
5				33.6	-	-	-
5				5.8	-	-	-
6				20.4	-	-	-
6				5.2	-	-	-
7				4.7	-	-	-
7				16.5	-	-	-
8				14.7	-	-	-
8				4.2	-	-	-
9				3.2	-	-	-
9				36.3	-	-	-
10				2.5	-	-	-
11				1.4	-	-	-
12				0.9	-	-	-
13				0.6	-	-	-
14				1.0	-	-	-
15				1.9	-	-	-

Contribution levels of the receivers

Source name	Level w/o NP		Level w NP	
	Day	Night	Day	Night
	dB(A)		dB(A)	
16	2.4	-	-	-
17	3.0	-	-	-
18	3.3	-	-	-
19	3.5	-	-	-
20	4.3	-	-	-
21	5.5	-	-	-
22	6.7	-	-	-
23	8.2	-	-	-
24	9.9	-	-	-
25	9.4	-	-	-
26	7.9	-	-	-
27	6.5	-	-	-
28	5.3	-	-	-
29	4.2	-	-	-
30	3.4	-	-	-
31	2.6	-	-	-
32	2.0	-	-	-
33	1.4	-	-	-
34	1.0	-	-	-
35	0.4	-	-	-
36	0.1	-	-	-
37	-0.5	-	-	-
38	-0.3	-	-	-
39	0.2	-	-	-
40	0.9	-	-	-
41	1.9	-	-	-
42	2.6	-	-	-
43	3.3	-	-	-
44	4.2	-	-	-
45	5.2	-	-	-
46	6.3	-	-	-
47	7.7	-	-	-
48	8.9	-	-	-
49	8.5	-	-	-
50	7.2	-	-	-
51	6.0	-	-	-
52	5.0	-	-	-
53	4.0	-	-	-
54	3.2	-	-	-
55	2.5	-	-	-
56	1.8	-	-	-
57	0.8	-	-	-
58	0.2	-	-	-
59	-0.8	-	-	-
60	-1.2	-	-	-
61	-1.3	-	-	-
62	-0.9	-	-	-
63	0.1	-	-	-
64	0.7	-	-	-
65	1.7	-	-	-
66	2.4	-	-	-
67	3.0	-	-	-
68	3.8	-	-	-
69	4.7	-	-	-
70	5.6	-	-	-
71	6.7	-	-	-
72	7.7	-	-	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19260 190th St Warehouse	Date:	4/27/20
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial Office to North		
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 =	10.00	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 =	0.352	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19260 190th St Warehouse	Date:	4/27/20
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial Office to North		
Address:			

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

INPUT

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

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

RESULTS

PPV =	0.191	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial Office to North		
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 =	10.00	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 =	0.830	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial Office to North		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	26.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.198	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial Office to North		
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 =	17.00	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 =	0.375	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Industrial to East		
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 =	50.00	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 =	0.031	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Industrial to East		
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 =	50.00	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 =	0.074	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial to West		
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 =	60.00	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 =	0.024	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19260 190th St Warehouse		Date: 4/27/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial to West		
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 =	60.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.056	IN/SEC	OUTPUT IN BLUE

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