Indian and Ramona Warehouse

NOISE IMPACT ANALYSIS

CITY OF PERRIS

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FEBRUARY 14, 2019

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
I-215	Interstate 215
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
LUCP	Land Use Compatibility Plan
MARB/IPA	March Air Reserve Base/Inland Port Airport
mph	Miles per hour
OPR	Office of Planning and Research
PVCC SP	Perris Valley Commerce Center Specific Plan
PPV	Peak particle velocity
Project	Indian and Ramona Warehouse
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this Noise Impact Analysis to determine the noise exposure and the necessary noise mitigation measures for the proposed Indian and Ramona Warehouse development ("Project"). The Project site is located in the City of Perris on the northwest corner of Indian Avenue and Ramona Expressway within the *Perris Valley Commerce Center Specific Plan* (PVCC SP) area. The Project is proposed to consist of a single high-cube transload and short-term storage warehouse building at approximately 428,730 square feet. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. Therefore, as a worst-case scenario, it is assumed the Project will operate 24-hours, seven days a week. This study has been prepared to satisfy the City of Perris noise standards and the thresholds of significance identified in the *Perris Valley Commerce Center Specific Plan Environmental Impact Report* (PVCC SP EIR), and Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1; 2)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on six roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Indian and Ramona Warehouse Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (3) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Existing plus Ambient (EA), and EA plus Cumulative (EAC) traffic conditions. The analysis shows that the Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

ON-SITE AIRCRAFT NOISE ANALYSIS

The Project site is located within March Air Reserve Base/Inland Port Airport (MARB/IPA)'s projected 70 to 75 dBA CNEL noise contours. In addition, the Project site is located within Accident Protection Zone (APZ) I and APZ II within Zone B1 and is limited to 25 people per acre in the APZ I and limited to 50 people per acre in the APZ II. The northern portion of the Project site, where parking and access is proposed, is within APZ I while the southern portion of the site, where the warehouse building, parking, and access are proposed, is within APZ II. The PVCC SP EIR identifies compatibility criteria for land uses within the Specific Plan related to the MARB/IPA noise level contour boundaries. When aircraft-related exterior noise levels approach 75 dBA CNEL, light industrial uses such as the proposed Project are considered *conditionally acceptable*. Further, the PVCC requires that *building office areas shall be constructed with appropriate sound mitigation measures as determined by an acoustical engineer or architect to insure appropriate interior sound levels*. (1) Since detailed building plans (e.g., wall, ceiling, and floor assemblies) were not available at the time of this analysis, an additional noise study shall be required to demonstrate compliance with the 2016 State of California's Green Building Standards Code requirements for non-residential land uses.

ON-SITE AIRCRAFT NOISE MITIGATION

- Prior to approval of a building permit for the proposed Project building, a noise study shall be required which demonstrates compliance with the latest State of California's Green Building Standards Code requirements for non-residential land uses, based on detailed building plans for the interior office areas. The noise study shall identify additional building materials, if necessary, to satisfy the State of California's Green Building Standards Code .

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Indian and Ramona Warehouse site, this analysis estimates the Project-related operational noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Indian and Ramona Warehouse are anticipated to generally include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. The operational noise analysis shows that the Project-related operational noise levels due to the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements will satisfy the City of Perris Municipal Code exterior noise level standards at all nearby sensitive receiver locations.

In addition, this analysis demonstrates that the Project will contribute *less than significant* operational noise level contributions to the existing ambient noise environment during the daytime and nighttime hours at all nearby sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities will be *less than significant*.

OPERATIONAL VIBRATION ANALYSIS

The operation of the Project site will include heavy trucks transiting on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for heavy trucks at normal traffic speeds do not exceed 65 VdB, and therefore, will be below the Federal Transit Administration (FTA) vibration threshold of 80 VdB at nearby sensitive receiver locations. Since truck deliveries transiting on site will be travelling at very low speeds it is expected that delivery truck vibration impacts at nearby homes will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the Project site boundary. Using sample reference noise levels to represent the planned construction activities of the Indian and Ramona Warehouse site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The Project-related short-term construction noise levels are expected to range from 47.8 to 68.1 dBA L_{eq} and will satisfy the City of Perris Municipal Code 80 dBA L_{eq} noise level threshold at all nearby noise-sensitive receiver

locations. Therefore, based on the results of this analysis, all receiver locations will experience *less than significant* impacts due to Project construction noise levels.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The analysis shows that the unmitigated Project-construction vibration levels of up to 60.8 VdB will remain below the Federal Transit Administration (FTA) 80 VdB threshold at all receiver locations, and are therefore, considered a *less than significant* impact. Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, and will likely only occur when heavy construction equipment is operating at the Project site perimeter.

Although Project construction noise and vibration impacts will be *less than significant*, the Project is required to comply with the following mitigation measures (MM) from the PVCC Specific Plan Environmental Impact Report:

MM Noise 1 *During all project site excavation and grading on site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturer's standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.*

MM Noise 2 *During construction, stationary construction equipment, stockpiling and vehicle staging areas would be placed a minimum of 446 feet away from the closest sensitive receptor.*

MM Noise 3 *No combustion-powered equipment, such as pumps or generators, shall be allowed to operate within 446 feet of any occupied residence unless the equipment is surrounded by a noise protection barrier.*

MM Noise 4 *Construction contractors of implementing development projects shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.*

SIGNIFICANCE FINDINGS

The results of this Indian and Ramona Warehouse Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	*n/a*
On-Site Aircraft Noise	3	*Potentially Significant*	*Less Than Significant*
Operational Noise	9	*Less Than Significant*	*n/a*
Operational Vibration		*Less Than Significant*	*n/a*
Construction Noise[1]	10	*Less Than Significant*	*n/a*
Construction Vibration[1]		*Less Than Significant*	*n/a*

[1] Although Project construction noise and vibration impacts will be less than significant, the Project is required to incorporate mitigation measures (MM) Noise 1 through MM Noise 4 from the PVCC Specific Plan Environmental Impact Report.
"n/a" = No mitigation is required.

1 INTRODUCTION

This Noise Impact Analysis has been completed to determine the noise impacts associated with the development of the proposed Indian and Ramona Warehouse ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Indian and Ramona Warehouse site is located in the City of Perris on the northwest corner of Indian Avenue and Ramona Expressway within the *Perris Valley Commerce Center Specific Plan* (PVCC SP), as shown on Exhibit 1-A.

A review of the Project study area indicates that nearby noise-sensitive uses do not conform to the underlying industrial land use designation of the PVCC SP and City of Perris Zoning Map. (1) (4) Land uses adjacent to the Project site include existing industrial use to the west; a mix of vacant lands and industrial uses to the north and northeast; an existing, non-conforming residential use and a mix of vacant lands to the east of the Project site across Indian Avenue, and industrial uses to the south across Ramona Expressway. The March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately 1.2 miles northwest of the Project site. In addition, the Project site is located within Accident Protection Zone (APZ) I and APZ II within Zone B1 and is limited to 25 people per acre in the APZ I and limited to 50 people per acre in the APZ II. The northern portion of the Project site, where parking and access is proposed, is within APZ I while the southern portion of the site, where the warehouse building, parking, and access are proposed, is within APZ II. The Interstate 215 (I-215) Freeway is located roughly 1 mile west of the Project site.

1.2 PROJECT DESCRIPTION

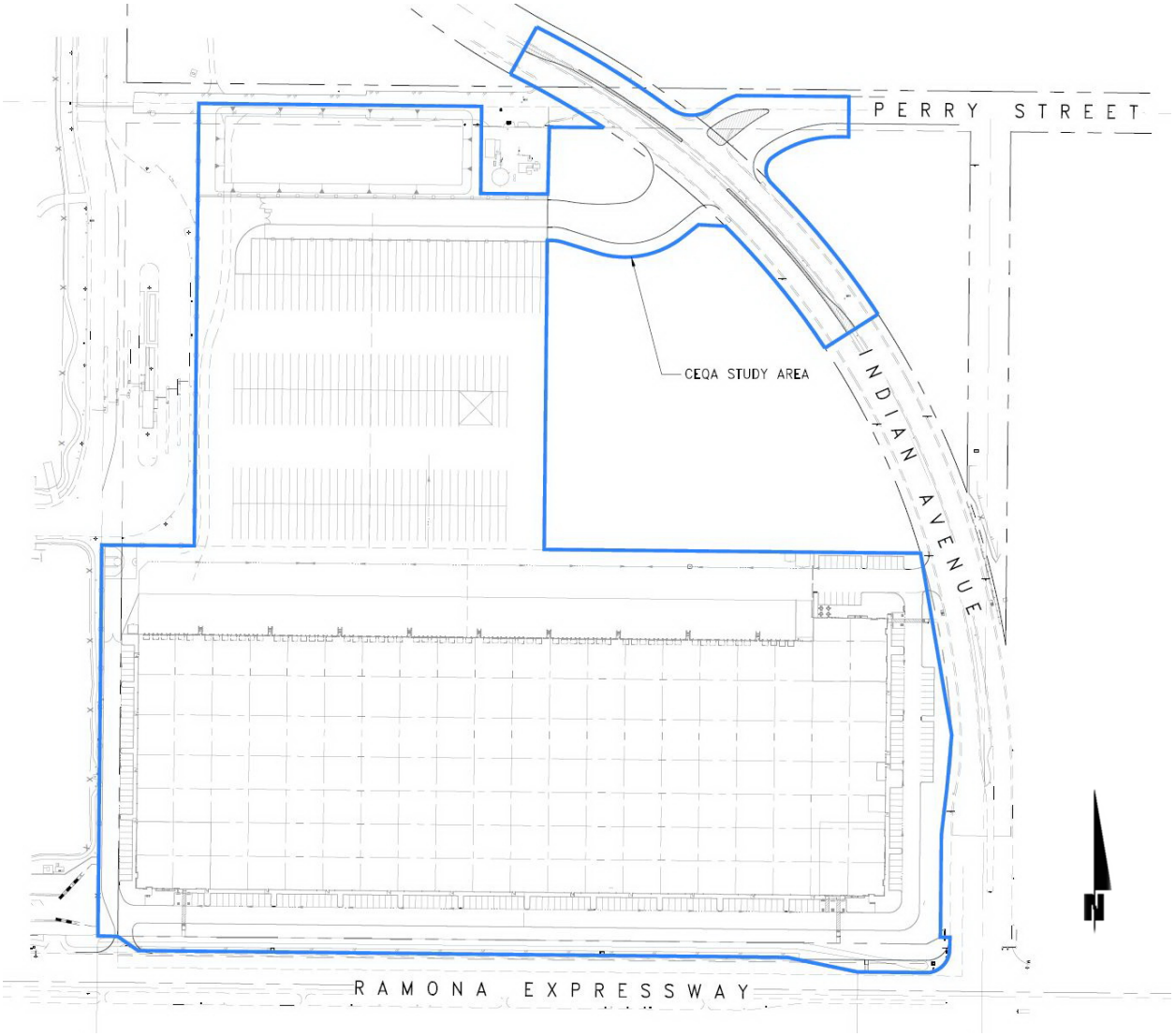
The Project is proposed to consist of a single high-cube transload and short-term storage warehouse building at approximately 428,730 square feet, as shown on Exhibit 1-B. Due to the location of the Project site in relation to APZ I and APZ II of the MARB/IPA, the maximum lot coverage of the Project buildings is limited to 50-percent. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. It is expected that the Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to generally include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the

expected typical industrial warehouse activities at the Project site. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

According to the *Indian and Ramona Warehouse Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a total of approximately 600 trip-ends per day (actual vehicles). (3) The Project trip generation includes 407 passenger cars and 193 truck trip-ends per day from Project operations within the Project site. This noise study relies on the Project trips to accurately account for the effect of individual passenger car and truck trips on the study area roadway network.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



2 FUNDAMENTALS

For consistency with the PVCC SP EIR, the following noise fundamentals discussion was taken from the EIR, Section 4.9 Noise, Page 4.9-2: (1)

The PVCC SP EIR defines noise *as unwanted or objectionable sound. The effect of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. The unit of measurement used to describe a noise level is the decibel (dB). However, since the human ear is not equally sensitive to all frequencies within the sound spectrum, 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. Decibels are measured on a logarithmic scale which quantifies sound intensity in a manner that is similar to the Richter scale used for earthquake magnitudes. In the case of noise, a doubling of the energy from a noise source, such as the doubling of a traffic volume, would increase the noise level by 3 dBA; a halving of the energy would result in a 3 dBA decrease.*

The PVCC SP EIR further states that *average noise levels over a period of minutes or hours are usually expressed as dB L_{eq} or the equivalent noise level for that period of time. For example, $L_{eq(3)}$ would represent a three hour average. When no time-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 (Ldn). CNEL is a 24-hour weighted average measure of community noise. The computation of CNEL adds 5 dBA to the average hourly noise levels between 7 p.m. and 10 p.m. (evening hours), and 10 dBA to the average hourly noise levels between 10p.m. to 7 a.m. (nighttime hours). This weighting accounts for the increased human sensitivity to noise in the evening and nighttime hours. Ldn is a very similar 24-hour weighted average which weights only the nighttime hours and not the evening hours. CNEL is normally about 1 dB higher than Ldn for typical traffic and other community noise levels.*

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3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research (OPR). (5) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2016 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (6) These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available, and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF PERRIS GENERAL PLAN

The City of Perris has adopted a Noise Element of the General Plan (7) to control and abate environmental noise, and to protect the citizens of Perris from excessive exposure to noise. The Noise Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the Noise Element identifies noise polices and implementation measures designed to protect, create, and maintain an environment free from noise that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life.

The noise standards identified in the City of Perris General Plan are guidelines to evaluate the acceptability of the transportation related noise level impacts. These standards are based on the Governor's Office of Planning and Research (OPR) and are used to assess the long-term traffic noise impacts on land uses. According to the City's Land Use Compatibility for Community Noise Exposure (Exhibit N-1), noise-sensitive land uses such as single-family residences are *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 65 dBA CNEL. Industrial uses, such as the Project, are considered *normally acceptable* with exterior noise levels of up to 70 dBA CNEL, and *conditionally acceptable* with exterior noise levels between 70 to 80 dBA CNEL. (7)

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Indian and Ramona Warehouse Project, operational noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements are typically evaluated against standards established under a City's Municipal Code.

The City of Perris Municipal Code, Chapter 7.34 *Noise Control*, Section 7.34.040, establishes the permissible noise level that may intrude into a neighbor's property from the use of sound amplifying equipment. The Municipal Code exterior noise level criteria for residential properties affected by operational noise sources is included in Section 7.34.050 *General Prohibition*, which states that the Section 7.34.040 sound amplifying equipment noise standards shall apply. Therefore, for residential properties, the exterior noise level shall not exceed 80 dBA L_{eq} during daytime hours (7:01 a.m. to 10:00 p.m.) and shall not exceed 60 dBA L_{eq} during the nighttime hours (10:01 p.m. to 7:00 a.m.), as shown on Table 3-1. (8) The City of Perris Municipal Code is included in Appendix 3.1.

Additional exterior noise level standards are identified in the City of Perris General Plan Noise Element Implementation Measure V.A.1 which requires that new industrial facilities within 160 feet of the property line of existing noise-sensitive land uses must demonstrate compliance with a 60 dBA CNEL exterior noise level standard. However, since the closest noise-sensitive residential property is located at a distance greater than 160 feet to the property line, which represents a non-conforming residential use on light industrial-designated land, an analysis based on the 60 dBA CNEL criteria is not required. For this analysis, noise impacts are analyzed at a distance of 187 feet to the outdoor living area (backyard) or building façade, whichever is closest, of the nearest residential home (represented by receiver location R1). Table 3-1 shows the Municipal Code and General Plan standards used in this analysis to evaluate the potential operational noise levels from the Project.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Noise Level Standard (dBA)[3]
City of Perris[1]	Residential[1]	Daytime (7:01 a.m. - 10:00 p.m.)	80 dBA L_{eq}
		Nighttime (10:01 p.m. - 7:00 a.m.)	60 dBA L_{eq}
	Within 160 Feet of PL[2]	24-Hours	60 dBA CNEL

[1] Source: City of Perris Municipal Code, Sections 7.34.040 & 7.34.050 (Appendix 3.1).
[2] Source: City of Perris General Plan Noise Element, Implementation Measure V.A.1. Since the Project site is located greater than 160 feet from the closest noise-sensitive use (non-conforming residential home), no analysis is required based on this criteria.
[3] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.
"PL" = Property line.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Indian and Ramona Warehouse site, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The City of Perris Municipal Code, Section 7.34.060, identifies the City's construction noise standards and permitted hours of construction activity (refer to Table 3-2). Further, the City of Perris Municipal Code, Section 7.34.060, noise level standard of 80 dBA L_{eq} at residential properties shall apply to the noise-sensitive receiver locations located in the City of Perris. (8)

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standard
City of Perris[1]	7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (with the exception of Columbus Day and Washington's birthday).	80 dBA L_{eq}

[1] Source: City of Perris Municipal Code, Section 7.34.060 (Appendix 3.1).

3.6 VIBRATION STANDARDS

The City of Perris has not identified or adopted specific vibration level standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep. (9) Operational and construction activities can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates

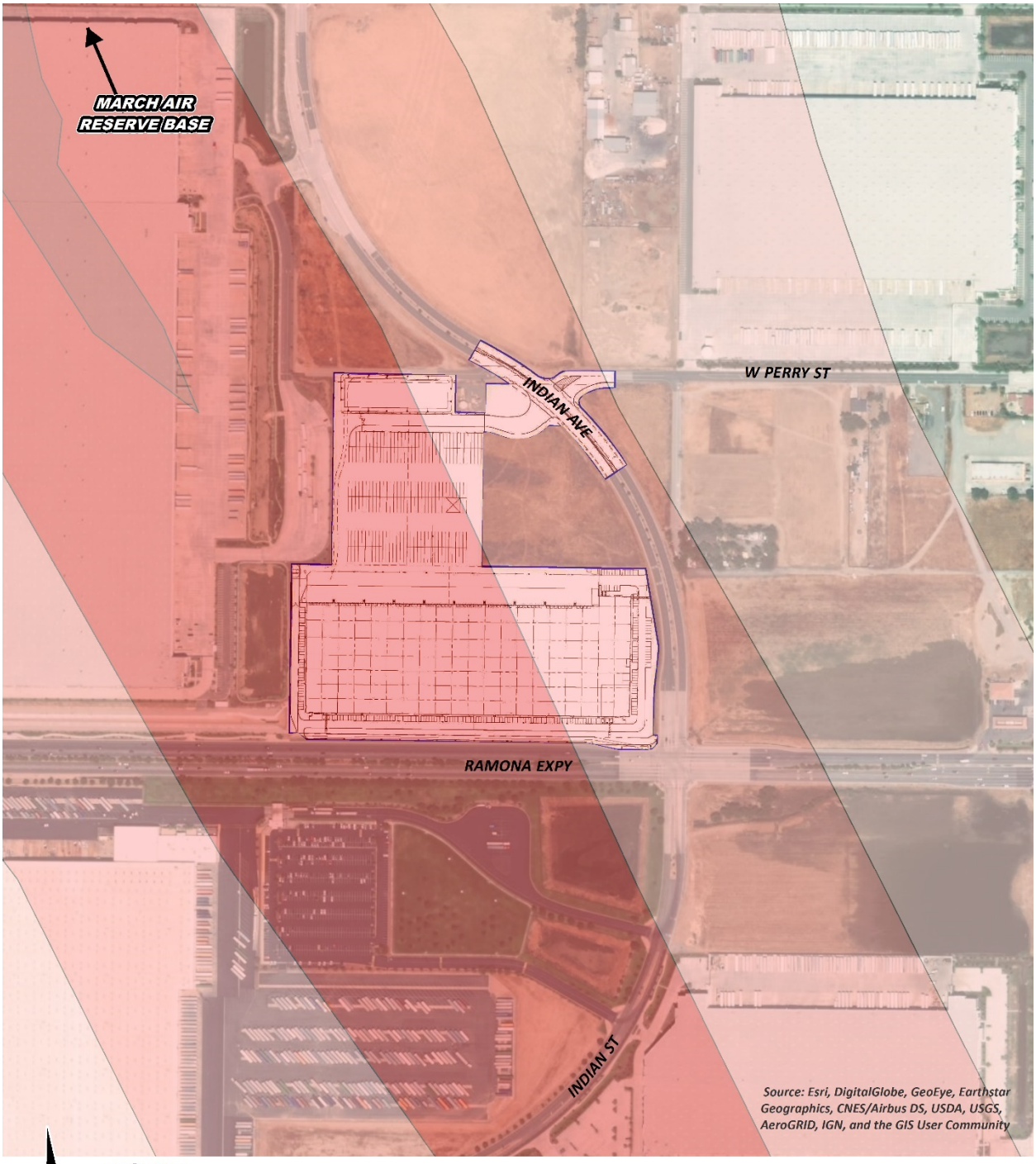
little or no ground vibration. Large bulldozers and loaded trucks can cause perceptible vibration levels proximate receptors. The FTA guidelines of 80 VdB for sensitive land uses provide a substantiated basis for determining the relative significance of potential Project-related vibration impacts due to on-site operational and construction activities.

3.7 MARCH AIR RESERVE BASE/INLAND PORT AIRPORT LAND USE COMPATIBILITY

The March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately 1.2-miles northwest of the Project site within Compatibility Zone B1. The Project site falls within MARB/IPA's projected 70 to 75 dBA CNEL noise contours, as shown on Exhibit 3-A. The PVCC SP EIR identifies compatibility criteria for land uses within the Specific Plan related to the MARB/IPA noise level contour boundaries. When aircraft-related exterior noise levels approach 75 dBA CNEL, light industrial uses such as the Project site are considered *conditionally acceptable*. Further, the PVCC requires that *building office areas shall be constructed with appropriate sound mitigation measures as determined by an acoustical engineer or architect to insure appropriate interior sound levels*. (1) Since detailed building plans (e.g., wall, ceiling, and floor assemblies) were not available at the time of this analysis, an additional noise study shall be required to demonstrate compliance with the 2016 State of California's Green Building Standards Code requirements for non-residential land uses, as outlined in the Executive Summary.

Additionally, as identified in the PVCC Specific Plan EIR (Figure 4.9-7, March Air Reserve Base Flight Tracks), the Project site is located beneath the identified flight tracks for airplanes using the MARB/IPA airfield. As such, there is potential for single-event noise exposure levels to affect the proposed Project. The exposure levels will vary depending on the type of aircraft and flight track flown for each operation at MARB/IPA.

EXHIBIT 3-A: MARB/IPA FUTURE AIRPORT NOISE CONTOURS



Source: Riverside County, Airport Land Use Compatibility Plan, Exhibit MA-4.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or

D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

E. For a project located within 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, expose people residing or working in the Project area to excessive noise levels.

F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the City of Perris General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Threshold A, they do not define the levels at which increases are considered substantial for use under Thresholds B, C, and D. CEQA Thresholds E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The closest airport which would require additional noise analysis under CEQA guidelines E and F is the MARB/IPA. As previously described in Section 3.7, additional analysis will be required once detailed Project building plans are available to ensure interior noise levels due to aircraft activity are satisfactory. Therefore, the potential impacts under CEQA guidelines E and F are *less than significant* with the mitigation identified in the Executive Summary, and are not further analyzed in this noise study.

4.1 PVCC SP EIR THRESHOLDS

As identified in the PVCC SP EIR, sensitive receivers are areas where humans are participating in activities that may be subject to the stress of significant interference from noise and often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Other receivers include office and industrial buildings, which are not considered as sensitive as single-family homes, but are still protected by City of Perris land use compatibility standards, as discussed below.

Noise level increases at nearby receiver locations resulting from the Project are evaluated based on the PVCC SP EIR Thresholds described below at nearby sensitive receiver locations. Further, CEQA requires that consideration be given to the magnitude of the increase, the existing ambient

noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (10)

According to the PVCC SP EIR, *there is no official "industry standard" of determining significance of noise impacts. However, typically, a jurisdiction will identify either 3 dBA or 5 dBA increase as being the threshold because these levels represent varying levels of perceived noise increases.* The PVCC SP EIR indicates that a 5 dBA noise level increase is considered *discernable to most people in an exterior environment* when the existing noise levels are below 60 dBA. Further, it identifies a 3 dBA increase threshold when the existing ambient noise levels already exceed 60 dBA. In addition, according to the PVCC SP EIR, an increase of 5 dBA or more above without Project noise levels is considered a significant impact at all non-noise-sensitive land uses. (1)

4.2 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a 5 dBA CNEL or greater Project-related noise level increase; or
    - exceed 60 dBA CNEL and the Project creates a 3 dBA CNEL or greater Project-related noise level increase (PVCC SP EIR, Page 4.9-20).
- If the Project creates a 5 dBA CNEL or greater Project-related off-site traffic noise level increase at non-noise-sensitive uses.

OPERATIONAL NOISE

- If Project-related operational noise levels exceed the 80 dBA L_{eq} daytime or 60 dBA L_{eq} nighttime noise level standards at the nearby sensitive receiver locations in the City of Perris (City of Perris Municipal Code, Section 7.34.040); or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a 5 dBA L_{eq} or greater Project-related noise level increase; or
    - exceed 60 dBA L_{eq} and the Project creates a 3 dBA L_{eq} or greater Project-related noise level increase (PVCC SP EIR, Page 4.9-20).
- If long-term project generated operational source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at noise-sensitive receiver locations.

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities create noise levels at sensitive receiver locations in the City of Perris which exceed the construction noise level limit of 80 dBA L_{eq} (City of Perris Municipal Code7.34.060).

- If short-term project generated construction source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at noise-sensitive receiver locations.

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 60 dBA CNEL	≥ 3 dBA CNEL Project increase	
	Non-Noise-Sensitive[1]	Exterior Noise Level Increase Threshold	≥ 5 dBA CNEL Project increase	
Operational Noise & Vibration	Perris	At residential land use[2]	80 dBA L_{eq}	60 dBA L_{eq}
	Noise-Sensitive	if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is > 60 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		Vibration Level Threshold[3]	80 VdB	
Construction Noise & Vibration	Noise-Sensitive	Noise Level Threshold[4]	80 dBA L_{eq}	
		Vibration Level Threshold[3]	80 VdB	

[1] Source: PVCC SP EIR, Page 4.9-20).
[2] Source: City of Perris Municipal Code, Section 7.34.040 (Appendix 3.1).
[3] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.
[4] Source: City of Perris Municipal Code, Section 7.34.060 (Appendix 3.1).
"Daytime" = 7:01 a.m. - 10:00 p.m.; "Nighttime" = 10:01 p.m. - 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, five 24-hour noise level measurements were taken at potential receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, July 19th, 2018. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (11)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (12) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (9)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (9) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby

sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:01 a.m. to 10:00 p.m.) and nighttime (10:01 p.m. to 7:00 a.m.) noise levels at each noise level measurement location consistent with the City of Perris Municipal Code. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels adjacent to the northern Project site boundary west of Indian Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 67.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 65.3 dBA L_{eq} with an average nighttime noise level of 58.5 dBA L_{eq}.
- Location L2 represents the noise levels east of the Project site on Perry Street adjacent to existing, non-conforming residential homes and an industrial warehouse use. The noise level measurements collected show an overall 24-hour exterior noise level of 62.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 60.7 dBA L_{eq} with an average nighttime noise level of 53.9 dBA L_{eq}.
- Location L3 represents the noise levels east of the Project site across Indian Avenue adjacent to an existing, non-conforming residential home. The noise level measurements collected show an overall 24-hour exterior noise level of 68.6 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 64.6 dBA L_{eq} with an average nighttime noise level of 61.5 dBA L_{eq}.
- Location L4 represents the noise levels southeast of the Project site on Perris Boulevard near existing commercial uses and a mobile home park. The noise level measurements collected show an overall 24-hour exterior noise level of 70.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 65.5 dBA L_{eq} with an average nighttime noise level of 62.9 dBA L_{eq}.
- Location L5 represents the noise levels west of the Project site on Brennan Avenue adjacent to existing residential homes and an industrial warehouse use. The noise level measurements collected show an overall 24-hour exterior noise level of 65.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 64.4 dBA L_{eq} with an average nighttime noise level of 55.6 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network (i.e., Indian Avenue, Perry Street, West Perry Street, North Perris Boulevard, and Ramona Expressway). This includes the auto and heavy truck activities near the noise level measurement locations. Additional background noise sources in the Project study area include aircraft overflight noise from the MARB/IPA. The 24-hour existing noise level measurements are shown on Table 5-1.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance to Project Boundary (Feet)	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	0'	Located adjacent to the northern Project site boundary west of Indian Avenue.	65.3	58.5	67.0
L2	875'	Located east of the Project site on Perry Street adjacent to existing, non-conforming residential homes and an industrial warehouse use.	60.7	53.9	62.4
L3	135'	Located east of the Project site across Indian Avenue adjacent to an existing, non-conforming residential home.	64.6	61.5	68.6
L4	1,990'	Located southeast of the Project site on Perris Boulevard near existing commercial uses and a mobile home park.	65.5	62.9	70.1
L5	1,730'	Located west of the Project site on Brennan Avenue adjacent to existing residential homes and an industrial warehouse use.	64.4	55.6	65.0

[1] See Exhibit 5-A for the noise level measurement locations.
[2] The long-term 24-hour measurement printouts are included in Appendix 5.2.
"Daytime" = 7:01 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:00 a.m.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (13) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (14) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (15)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the six study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications according to the City of Perris *General Plan Circulation Element*, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-2 were obtained from the *Indian and Ramona Warehouse Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Existing plus Ambient (EA), and EA plus Cumulative (EAC) conditions. (3) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned Land Use (Existing if Different)[1]	Distance from Centerline to Nearest Adjacent Land Use (Feet)[2]	Posted Speed Limit (mph)
1	Indian Av.	n/o Dwy. 2	Light Industrial	47'	40
2	Indian Av.	n/o Perry St.	Light Industrial	47'	40
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	47'	40
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	47'	40
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	92'	55
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	92'	55

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Element.
"Res." = Residential

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing (2018)		Existing plus Ambient (EA)		EA plus Cumulative (EAC)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Indian Av.	n/o Dwy. 2	7,798	8,113	8,273	8,588	9,399	9,714
2	Indian Av.	n/o Perry St.	7,798	7,920	8,273	8,395	9,399	9,521
3	Indian Av.	s/o Perry St.	7,187	7,309	7,625	7,747	8,751	8,873
4	Indian Av.	n/o Ramona Exwy.	7,187	7,268	7,625	7,706	8,751	8,832
5	Ramona Exwy.	w/o Dwy. 1	48,427	48,753	51,376	51,702	60,191	60,517
6	Ramona Exwy.	e/o Indian Av.	44,081	44,142	46,766	46,827	53,310	53,371

[1] Source: Indian and Ramona Warehouse Traffic Impact Analysis, Urban Crossroads, Inc., October 2018.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	63.45%	12.29%	24.26%	100.00%
Medium Trucks	68.39%	8.69%	22.92%	100.00%
Heavy Trucks	64.84%	8.73%	26.43%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 5/24/2018 on Ramona Expressway and Indian Avenue (Indian and Ramona Warehouse Traffic Impact Analysis, October 2018). All values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *Indian and Ramona Warehouse Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a total of approximately 600 trip-ends per day (actual vehicles). (3) The Project trip generation includes 407 passenger cars and 193 truck trip-ends per day from Project operations within the Project site. This noise study relies on the Project trips to accurately account for the effect of individual passenger car and truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

The daily Project automobile and truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project automobile and truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all roadway segments in the without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

Classification	Total Daily % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	86.90%	6.38%	6.73%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 5/24/2018 on Ramona Expressway and Indian Avenue (Indian and Ramona Warehouse Traffic Impact Analysis, October 2018). All values rounded to the nearest one-hundredth.

TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Indian Av.	n/o Dwy. 2	85.03%	6.52%	8.45%	100.00%
2	Indian Av.	n/o Perry St.	87.10%	6.28%	6.62%	100.00%
3	Indian Av.	s/o Perry St.	87.11%	6.27%	6.61%	100.00%
4	Indian Av.	n/o Ramona Exwy.	87.04%	6.31%	6.65%	100.00%
5	Ramona Exwy.	w/o Dwy. 1	86.98%	6.34%	6.68%	100.00%
6	Ramona Exwy.	e/o Indian Av.	86.91%	6.37%	6.72%	100.00%

[1] Source: Indian and Ramona Warehouse Traffic Impact Analysis, October 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Indian Av.	n/o Dwy. 2	85.13%	6.52%	8.35%	100.00%
2	Indian Av.	n/o Perry St.	87.09%	6.29%	6.63%	100.00%
3	Indian Av.	s/o Perry St.	87.10%	6.28%	6.62%	100.00%
4	Indian Av.	n/o Ramona Exwy.	87.03%	6.31%	6.66%	100.00%
5	Ramona Exwy.	w/o Dwy. 1	86.98%	6.34%	6.68%	100.00%
6	Ramona Exwy.	e/o Indian Av.	86.91%	6.37%	6.72%	100.00%

[1] Source: Indian and Ramona Warehouse Traffic Impact Analysis, October 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: EA PLUS CUMULATIVE WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Indian Av.	n/o Dwy. 2	85.33%	6.50%	8.17%	100.00%
2	Indian Av.	n/o Perry St.	87.06%	6.30%	6.64%	100.00%
3	Indian Av.	s/o Perry St.	87.08%	6.29%	6.63%	100.00%
4	Indian Av.	n/o Ramona Exwy.	87.02%	6.32%	6.67%	100.00%
5	Ramona Exwy.	w/o Dwy. 1	86.97%	6.34%	6.69%	100.00%
6	Ramona Exwy.	e/o Indian Av.	86.91%	6.37%	6.72%	100.00%

[1] Source: Indian and Ramona Warehouse Traffic Impact Analysis, October 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-8. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe

the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $L_{VdB}(D) = L_{VdB}(25\ ft) - 30\log(D/25)$

TABLE 6-8: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet[1]
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

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

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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Indian and Ramona Warehouse Traffic Impact Analysis*. (3) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions, without and with the proposed Project.
- Existing plus Ambient (EA) Without / With Project: This scenario refers to the background noise conditions without and with the proposed Project plus ambient growth.
- EA plus Cumulative (EAC) Without / With Project: This scenario refers to the background noise conditions without and with the proposed Project plus ambient growth. This scenario corresponds to future conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic based on the PVCC SP EIR significance criteria discussed in Section 4.1. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not take into account the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the six study area roadway segments analyzed from the without Project to the with Project conditions in each of the three timeframes: Existing, Existing plus Ambient (EA), and EA plus Cumulative (EAC) conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the six traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	73.0	74	159	343
2	Indian Av.	n/o Perry St.	Light Industrial	73.0	74	159	343
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	72.6	70	151	325
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	72.6	70	151	325
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	78.9	363	783	1686
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	78.5	341	735	1583

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	73.8	84	181	391
2	Indian Av.	n/o Perry St.	Light Industrial	73.0	74	160	344
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	72.6	70	151	326
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	72.6	70	151	326
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	79.0	364	784	1688
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	78.5	341	735	1584

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

TABLE 7-3: EXISTING PLUS AMBIENT WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	73.2	77	166	357
2	Indian Av.	n/o Perry St.	Light Industrial	73.2	77	166	357
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	72.9	73	157	338
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	72.9	73	157	338
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	79.2	378	814	1754
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	78.8	355	765	1647

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

TABLE 7-4: EXISTING PLUS AMBIENT WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	74.0	87	187	404
2	Indian Av.	n/o Perry St.	Light Industrial	73.2	77	166	358
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	72.9	73	157	339
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	72.9	73	157	339
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	79.2	378	815	1756
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	78.8	355	765	1648

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

TABLE 7-5: EA PLUS CUMULATIVE WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	73.8	84	181	389
2	Indian Av.	n/o Perry St.	Light Industrial	73.8	84	181	389
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	73.5	80	172	371
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	73.5	80	172	371
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	79.9	420	905	1949
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	79.4	387	834	1797

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

TABLE 7-6: EA PLUS CUMULATIVE WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Existing Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Indian Av.	n/o Dwy. 2	Light Industrial	74.5	93	201	434
2	Indian Av.	n/o Perry St.	Light Industrial	73.8	84	181	390
3	Indian Av.	s/o Perry St.	Light Industrial (Non-Conforming Res.)	73.5	80	172	372
4	Indian Av.	n/o Ramona Exwy.	Light Industrial	73.5	80	172	371
5	Ramona Exwy.	w/o Dwy. 1	Light Industrial	79.9	420	906	1951
6	Ramona Exwy.	e/o Indian Av.	Light Industrial (Commercial)	79.4	387	834	1798

[1] Sources: Perris Valley Commerce Center Land Use Plan and Nearmap aerial imagery.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.
"Res." = Residential

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The Exiting without Project exterior noise levels are expected to range from 72.6 to 78.9 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 72.6 to 79.0 dBA CNEL. As shown on Table 7-7 the Project is expected to generate an exterior noise level increase of up to 0.8 dBA CNEL, which will remain below the significance threshold of 3 dBA CNEL when the without Project noise levels already exceed 60 dBA CNEL at noise-sensitive uses, and is below the 5 dBA CNEL increase threshold for non-noise-sensitive uses. Therefore, the off-site Project-related traffic

noise level increase is considered a *less than significant* impact under Existing with Project conditions.

TABLE 7-7: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Indian Av.	n/o Dwy. 2	73.0	73.8	0.8	No	No
2	Indian Av.	n/o Perry St.	73.0	73.0	0.0	No	No
3	Indian Av.	s/o Perry St.	72.6	72.6	0.0	Yes	No
4	Indian Av.	n/o Ramona Exwy.	72.6	72.6	0.0	No	No
5	Ramona Exwy.	w/o Dwy. 1	78.9	79.0	0.1	No	No
6	Ramona Exwy.	e/o Indian Av.	78.5	78.5	0.0	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

7.3 EXISTING PLUS AMBIENT PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the Existing plus Ambient (EA) without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 72.9 to 79.2 dBA CNEL without the Project. Table 7-4 presents the EA with Project conditions noise level contours that are expected to range from 72.9 to 79.2 dBA CNEL. As shown on Table 7-8 the Project is expected to generate an exterior noise level increase of up to 0.8 dBA CNEL, which will remain below the significance thresholds of 3 dBA CNEL when the without Project noise levels already exceed 60 dBA CNEL at noise-sensitive uses, and is below the 5 dBA CNEL increase threshold for non-noise-sensitive uses. Therefore, the off-site Project-related traffic noise level increase is considered a *less than significant* impact under EA conditions.

TABLE 7-8: EA OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Indian Av.	n/o Dwy. 2	73.2	74.0	0.8	No	No
2	Indian Av.	n/o Perry St.	73.2	73.2	0.0	No	No
3	Indian Av.	s/o Perry St.	72.9	72.9	0.0	Yes	No
4	Indian Av.	n/o Ramona Exwy.	72.9	72.9	0.0	No	No
5	Ramona Exwy.	w/o Dwy. 1	79.2	79.2	0.0	No	No
6	Ramona Exwy.	e/o Indian Av.	78.8	78.8	0.0	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

7.4 EXISTING PLUS AMBIENT PLUS CUMULATIVE PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-9 presents a comparison of the EA plus Cumulative (EAC) without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 73.5 to 79.9 dBA CNEL without the Project. Table 7-6 presents the EAC with Project conditions noise level contours that are expected to range from 73.5 to 79.9 dBA CNEL. As shown on Table 7-9 the Project is expected to generate an exterior noise level increase of up to 0.7 dBA CNEL, which would remain below the significance thresholds of 3 dBA CNEL when the without Project noise levels already exceed 60 dBA CNEL at noise-sensitive uses, and is below the 5 dBA CNEL increase threshold for non-noise-sensitive uses. Therefore, the off-site Project-related traffic noise level increase is considered a *less than significant* impact under EAC conditions.

TABLE 7-9: EAC OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?[2]	Threshold Exceeded?[3]
			No Project	With Project	Project Addition		
1	Indian Av.	n/o Dwy. 2	73.8	74.5	0.7	No	No
2	Indian Av.	n/o Perry St.	73.8	73.8	0.0	No	No
3	Indian Av.	s/o Perry St.	73.5	73.5	0.0	Yes	No
4	Indian Av.	n/o Ramona Exwy.	73.5	73.5	0.0	No	No
5	Ramona Exwy.	w/o Dwy. 1	79.9	79.9	0.0	No	No
6	Ramona Exwy.	e/o Indian Av.	79.4	79.4	0.0	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the nearest adjacent land use.
[2] "Yes" = Existing, noise-sensitive land uses adjacent to the study area roadway segment.
[3] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. As identified in the PVCC SP EIR, sensitive receivers are areas where humans are participating in activities that may be subject to the stress of significant interference from noise and often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Other receivers include office and industrial buildings, which are not considered as sensitive as single-family homes, but are still protected by City of Perris land use compatibility standards, as discussed below.

Representative sensitive receivers in the Project study area include single-family residential homes as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Location R1 represents existing, non-conforming residential homes within light industrial-designated land use located approximately 187 feet east of the Project site. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

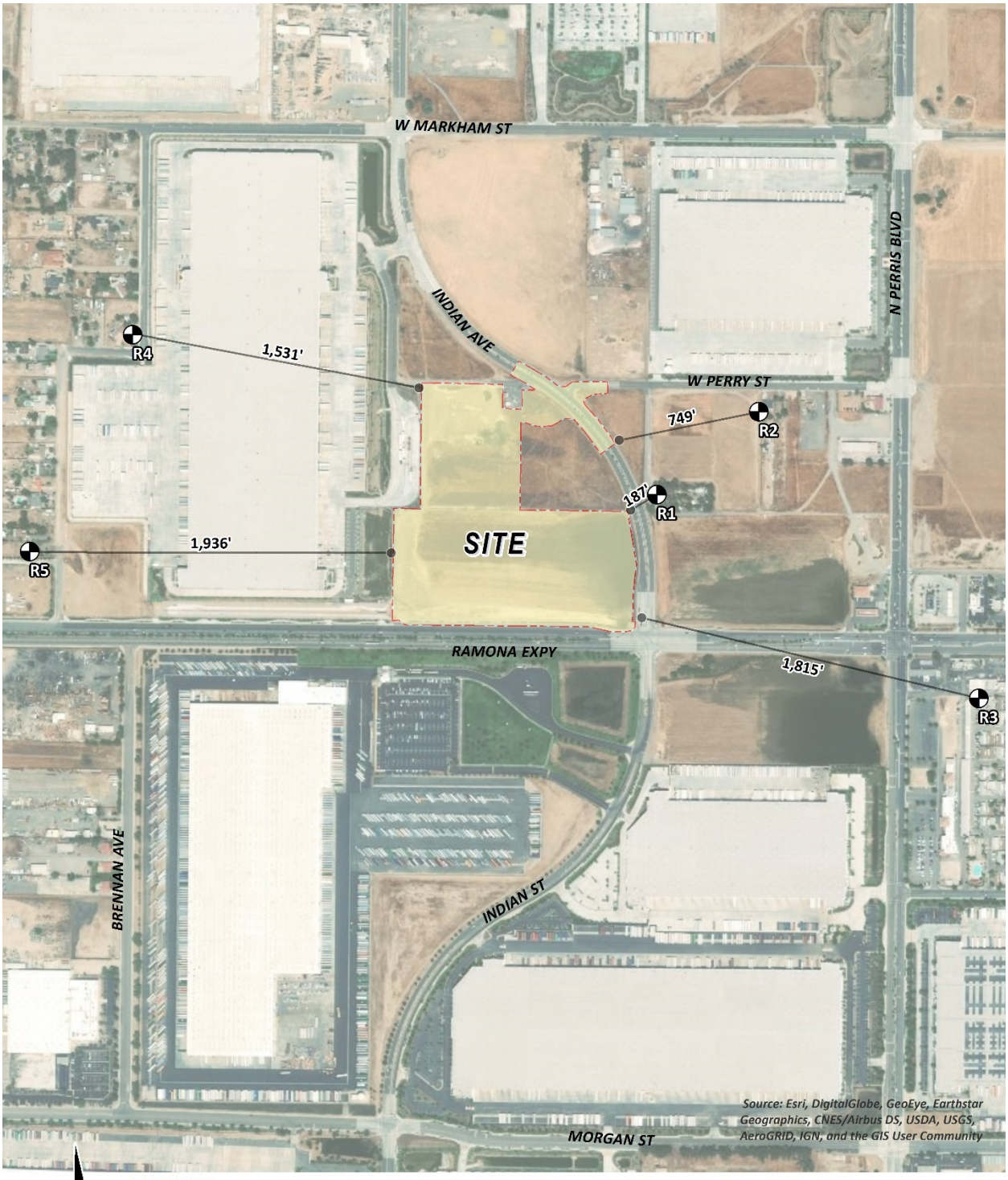
R2: Location R2 represents existing, non-conforming residential homes located approximately 749 feet east of the Project site near existing industrial uses. A long-term noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents existing residential homes located approximately 1,815 feet southeast of the Project site. A long-term noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R4: Location R4 represents existing residential homes located approximately 1,531 feet northwest of the Project site. A long-term noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R5: Location R5 represents existing residential homes located approximately 1,936 feet west of the Project site. A long-term noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from operation of the proposed Indian and Ramona Warehouse Project. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to generally include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. At the time of this analysis, no cold storage was planned at the Project site, and therefore is not analyzed in this report.

9.2 REFERENCE NOISE LEVELS

Since the future tenants of the proposed Project are unknown, the Project's operational noise levels were estimated based on reference noise level measurements of similar operational activities. The reference noise levels are intended to describe the expected operational noise sources that may generally include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. To estimate the Project off-site operational noise impacts associated with the Indian and Ramona Warehouse, the following reference noise level measurements were collected from existing similar operational noise sources, as shown on Table 9-1.

9.2.1 MOTIVATIONAL FULFILLMENT & LOGISTICS SERVICES DISTRIBUTION FACILITY (DRY GOODS)

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area on the western side of the building façade. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA L_{eq} at a uniform distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition,

during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.

While the specific noise levels at the Project site will depend on the actual tenant, the intensity and the daytime / nighttime hours of operation, a reference noise level of 62.8 dBA L_{eq} for the unloading/docking activity at a normalized distance of 50 feet is used to describe the peak Project operational noise activity since it represents similar operational characteristics. The reference noise level of 62.8 dBA L_{eq} at 50 feet is intended to describe the worst-case noise levels associated with the expected typical warehouse and distribution storage operations at the Project site.

9.2.2 ROOF-TOP AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a mechanical roof-top air conditioning unit on the roof of an existing Walmart store with additional units operating in the background. The reference noise level represents Lennox SCA120 series 10-ton model packaged air conditioning units. Based on observations of similar warehouse buildings with interior offices made by Urban Crossroads, Inc., it is expected that actual roof-top air conditioning units used on the roof-top of the Project building would range from two to six tons per unit. (16) Therefore, the reference 10-ton unit noise level used in this analysis likely overstates actual operational noise levels of the Project's roof-top air conditioning units. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours, for a total of 39 minutes per hour, and are anticipated to operate during the daytime and nighttime hours at the Project site. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

9.2.3 PARKING LOT VEHICLE MOVEMENTS (AUTOS)

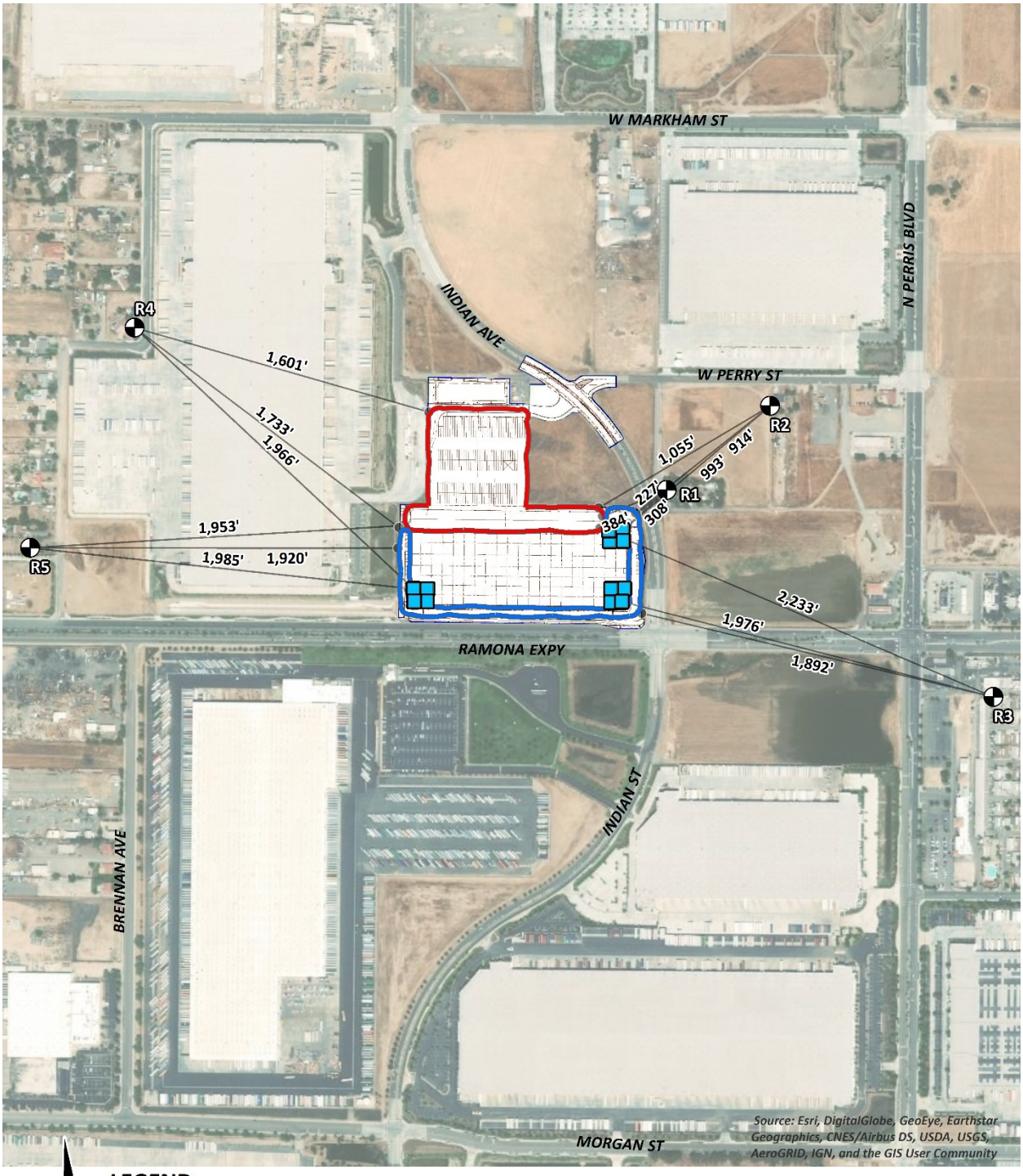
To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation office and warehouse building in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 41.7 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking, and represents peak activity observed over a 24-hour period. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Hourly Activity (Minutes)[3]	Noise Level (dBA L_{eq})	
					@ Ref. Distance	@ 50 Feet
Unloading/Docking Activity[1]	00:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Units[2]	96:00:00	5'	25'	39	77.2	57.2
Parking Lot Vehicle Movements[3]	01:00:00	10'	5'	60	52.2	41.7

[1] Reference noise level measurements were collected on 1/7/2015 from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino.
[2] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[3] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[4] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



9.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed warehouse operations that generally include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 9-2, account for the distance attenuation provided due to geometric spreading when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source.

Table 9-2 presents the combined total Project-only operational noise level projections at the nearby sensitive receiver locations in comparison with the City of Perris Municipal Code exterior noise level standards. The Project operational noise levels at the nearby sensitive receiver locations are shown to range from 23.7 to 46.3 dBA L_{eq}. Based on the results of this analysis, the Project operational noise levels associated with the Indian and Ramona Warehouse will satisfy the City of Perris Municipal Code exterior noise level standards. The operational noise level calculations are included in Appendix 9.1.

The City of Perris General Plan Noise Element, Implementation Measure V.A.1, indicates that industrial development within 160 feet of sensitive receiver locations cannot exceed 60 dBA CNEL. However, since the closest noise-sensitive residential home, which represents a non-conforming residential use on light industrial-designated land, is located outside of the 160-foot screening distance at approximately 187 feet, the analysis based on the 60 dBA CNEL criteria is not required.

TABLE 9-2: OPERATIONAL NOISE LEVEL COMPLIANCE (DBA L_{EQ})

Receiver Location[1]	Noise Sources[2]			Combined Operational Noise Levels (dBA L_{eq})[3]	Noise Level Standard (dBA L_{eq})[4]		Threshold Exceeded?[5]	
	Unloading/ Docking Activity	Roof-Top Air Conditioning Unit	Parking Lot Vehicle Movements		Daytime	Nighttime	Daytime	Nighttime
R1	45.1	39.5	31.9	46.3	80	60	No	No
R2	36.3	29.3	22.8	37.2	80	60	No	No
R3	29.8	23.4	18.0	30.9	80	60	No	No
R4	22.6	18.5	8.3	24.1	80	60	No	No
R5	22.2	17.7	8.9	23.7	80	60	No	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Calculations for each noise source are provided in Appendix 9.1.
[4] Exterior noise level standard as shown on Table 3-1.
[5] Do the estimated Project operational noise source activities exceed the noise level threshold?

9.4 PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (12) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 9-3 and 9-4.

As indicated on Tables 9-3 and 9-4, the Project will contribute a daytime operational noise level increase of up to 0.1 dBA L_{eq} and a nighttime operational noise level increase of up to 0.1 dBA L_{eq} at the sensitive receiver locations. Since the Project-related operational noise level contributions would not exceed the significance criteria of 5 dBA L_{eq} when the without Project noise levels are below 60 dBA CNEL or 3 dBA L_{eq} when the without Project noise levels already exceed 60 dBA CNEL discussed in Section 4, the increases at the sensitive receiver locations are considered *less than significant*.

TABLE 9-3: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Threshold[7]	Threshold Exceeded?[7]
R1	46.3	L3	64.6	64.7	0.1	3.0	No
R2	37.2	L2	60.7	60.7	0.0	3.0	No
R3	30.9	L4	65.5	65.5	0.0	3.0	No
R4	24.1	L5	64.4	64.4	0.0	3.0	No
R5	23.7	L5	64.4	64.4	0.0	3.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 9-4: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Threshold[7]	Threshold Exceeded?[7]
R1	46.3	L3	61.5	61.6	0.1	3.0	No
R2	37.2	L2	53.9	54.0	0.1	5.0	No
R3	30.9	L4	62.9	62.9	0.0	3.0	No
R4	24.1	L5	55.6	55.6	0.0	5.0	No
R5	23.7	L5	55.6	55.6	0.0	5.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

9.5 OPERATIONAL VIBRATION IMPACTS

Although the human threshold of perception for vibration is around 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement condition. Typical vibration levels for heavy trucks at normal traffic speeds do not exceed 65 VdB, and therefore, will be below the FTA vibration threshold of 80 VdB at nearby sensitive receiver locations. Truck deliveries transiting on site will be travelling at very low speeds, so it is expected that delivery truck vibration impacts at nearby homes will not exceed the 80 VdB vibration threshold.

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10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 8.

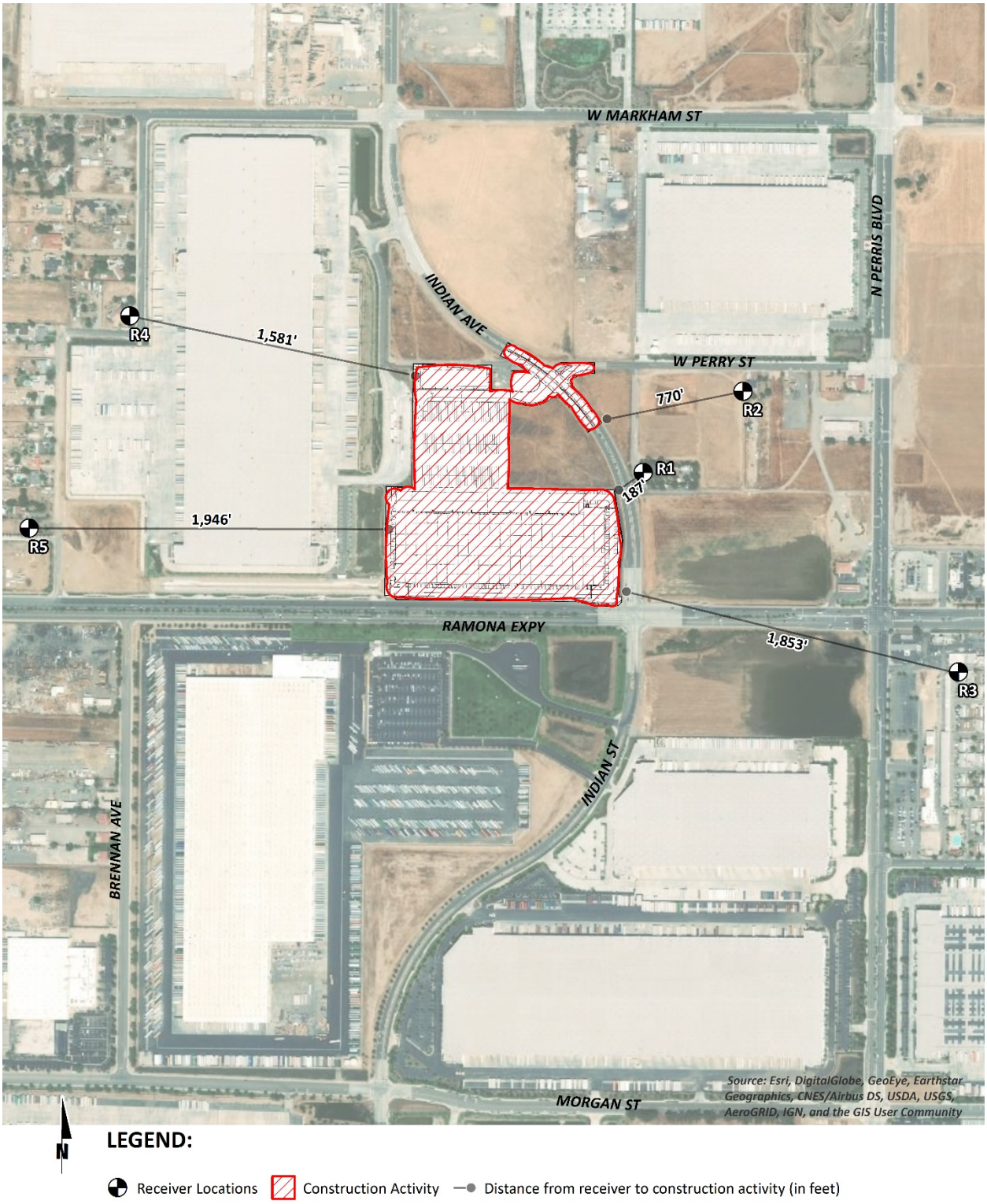
10.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages and equipment are based on the *Indian and Ramona Warehouse Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (17)

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS



10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a common reference distance of 50 feet.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[6]
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	59.2
2	Dozer Activity[1]	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	67.5
4	Foundation Trenching[2]	30'	72.6	68.2
5	Rough Grading Activities[2]	30'	77.9	73.5
6	Framing[3]	30'	66.7	62.3
7	Dozer Pass-By[4]	30'	84.0	79.6
8	Two Scrapers Pass-By[4]	30'	83.7	79.3
9	Concrete Mixer Truck Movements[5]	50'	71.2	71.2
10	Concrete Paver Activities[5]	30'	70.0	65.6
11	Concrete Mixer Pour & Paving Activities[5]	30'	70.3	65.9
12	Concrete Mixer Backup Alarms & Air Brakes[5]	50'	71.6	71.6
13	Concrete Mixer Pour Activities[5]	50'	67.7	67.7

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations at an industrial construction site in the City of Ontario.
[5] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 10-2 to 10-6 present the short-term construction noise levels for each stage of construction. Table 10-7 provides a summary of the construction noise levels by phase at the noise receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the highest construction noise levels, this analysis shows the noise impacts when the equipment with the highest reference noise level is operating at the closest point from the primary construction activity to each receiver location.

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Dozer Pass-By	79.6
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	79.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	187'	-11.5	0.0	68.1
R2	770'	-23.8	0.0	55.8
R3	1,853'	-31.4	0.0	48.2
R4	1,581'	-30.0	0.0	49.6
R5	1,946'	-31.8	0.0	47.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier/berm attenuation from existing barriers/berms in the Project study area.

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Two Scrapers Pass-By	79.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	79.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	187'	-11.5	0.0	68.1
R2	770'	-23.8	0.0	55.8
R3	1,853'	-31.4	0.0	48.2
R4	1,581'	-30.0	0.0	49.6
R5	1,946'	-31.8	0.0	47.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier/berm attenuation from existing barriers/berms in the Project study area.

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	187'	-11.5	0.0	56.7
R2	770'	-23.8	0.0	44.4
R3	1,853'	-31.4	0.0	36.8
R4	1,581'	-30.0	0.0	38.2
R5	1,946'	-31.8	0.0	36.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier/berm attenuation from existing barriers/berms in the Project study area.

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	187'	-11.5	0.0	60.1
R2	770'	-23.8	0.0	47.8
R3	1,853'	-31.4	0.0	40.2
R4	1,581'	-30.0	0.0	41.6
R5	1,946'	-31.8	0.0	39.8

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier/berm attenuation from existing barriers/berms in the Project study area.

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.5

Receiver Location	Distance To Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	187'	-11.5	0.0	56.0
R2	770'	-23.8	0.0	43.7
R3	1,853'	-31.4	0.0	36.1
R4	1,581'	-30.0	0.0	37.5
R5	1,946'	-31.8	0.0	35.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier/berm attenuation from existing barriers/berms in the Project study area.

10.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when equipment is operating at the closest point from primary construction activity to each sensitive receiver location. As shown on Table 10-7, the highest unmitigated construction noise levels are expected to range from 35.7 to 68.1 dBA L_{eq} at the nearby sensitive receiver locations.

TABLE 10-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA L_{EQ})

Receiver Location[1]	Construction Hourly Noise Level (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Levels[2]
R1	68.1	68.1	56.7	60.1	56.0	68.1
R2	55.8	55.8	44.4	47.8	43.7	55.8
R3	48.2	48.2	36.8	40.2	36.1	48.2
R4	49.6	49.6	38.2	41.6	37.5	49.6
R5	47.8	47.8	36.4	39.8	35.7	47.8

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak operating conditions.

As shown on Table 10-8, the highest Project construction noise levels will satisfy the 80 dBA L_{eq} City of Perris Municipal Code threshold for construction activity at the sensitive receiver locations. Therefore, impacts from Project construction noise levels are considered *less than significant*. Further, the unmitigated construction equipment noise levels shown in this analysis do not include any additional barrier attenuation provided by intervening structures in the Project study area (e.g., buildings, barriers, berms, etc.)

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Activity Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	68.1	80	No
R2	55.8	80	No
R3	48.2	80	No
R4	49.6	80	No
R5	47.8	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise levels during peak operating conditions, as shown on Table 10-7.
[3] Construction noise level threshold as shown on Table 4-2.
[4] Do the estimated Project construction noise levels meet the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-8 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-9 presents the expected Project related vibration levels at the nearby receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference level of 87 VdB at 25 feet. At distances ranging from 187 to 1,946 feet from the Project construction activities, construction vibration levels are expected to range from 30.3 to 60.8 VdB, as shown on Table 10-9. Using the construction vibration assessment methods provided by the FTA, Project construction vibration levels will remain below the FTA 80 VdB threshold at all sensitive receiver locations, and therefore, is considered a *less than significant* impact.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter.

TABLE 10-9: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Levels	
R1	187'	31.8	52.8	59.8	60.8	60.8	No
R2	770'	13.3	34.3	41.3	42.3	42.3	No
R3	1,853'	1.9	22.9	29.9	30.9	30.9	No
R4	1,581'	4.0	25.0	32.0	33.0	33.0	No
R5	1,946'	1.3	22.3	29.3	30.3	30.3	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?

Although Project construction noise and vibration impacts will be *less than significant*, the Project is required to incorporate the following mitigation measures (MM) from the PVCC Specific Plan Environmental Impact Report:

MM Noise 1 *During all project site excavation and grading on site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturer's standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.*

MM Noise 2 *During construction, stationary construction equipment, stockpiling and vehicle staging areas would be placed a minimum of 446 feet away from the closest sensitive receptor.*

MM Noise 3 *No combustion-powered equipment, such as pumps or generators, shall be allowed to operate within 446 feet of any occupied residence unless the equipment is surrounded by a noise protection barrier.*

MM Noise 4 *Construction contractors of implementing development projects shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.*

11 REFERENCES

1. **City of Perris.** *Perris Valley Commerce Center Specific Plan Environmental Impact Report.* July 2011.
2. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
3. **Urban Crossroads, Inc.** *Indian and Ramona Warehouse Traffic Impact Analysis.* October 2018.
4. **City of Perris.** *Zoning Map.* October 2016.
5. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2017.
6. **State of California.** *2016 California Green Building Standards Code.* January 2017.
7. **City of Perris.** *General Plan Noise Element.* August 2005.
8. —. *Municipal Code, Chapter 7.34 Noise Control.*
9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2006.
10. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
11. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
12. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
13. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
14. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
15. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
16. **Urban Crossroads, Inc.** *Observations of the Arcadia Logistics Center Roof-Top Air Conditioning Units for Interior Offices.* 2018.
17. —. *Indian and Ramona Warehouse Air Quality Impact Analysis.* January 2019.

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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Indian and Ramona Warehouse Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

Bill Lawson, P.E., INCE
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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF PERRIS MUNICIPAL CODE

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CHAPTER 7.34. - NOISE CONTROL

Sec. 7.34.010. - Declaration of policy.

Excessive noise levels are detrimental to the health and safety of individuals. Noise is considered a public nuisance, and the city discourages unnecessary, excessive or annoying noises from all sources. Creating, maintaining, causing, or allowing to be created, caused or maintained, any noise or vibration in a manner prohibited by the provisions of the ordinance codified in this chapter is a public nuisance and shall be punishable as a misdemeanor.

(Code 1972, § 7.34.010; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.020. - Definitions.

(a) *General.* The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Ambient noise means the all-encompassing noise associated with a given environment usually being composed of sounds from many sources near and far. For the purpose of this chapter, ambient noise level is the level obtained when the noise level is averaged over a period of five minutes without inclusion of noise from isolated identifiable sources at the location and time of day near that at which a comparison is to be made.

Decibel (dB) means an intensity unit which denotes the ratio between two quantities which are proportional to power; the number of decibels corresponding to the ratio is ten times the common logarithm of this ratio.

Sound amplifying equipment means any machine or device for the amplification of the human voice, music or any other sound. The term "sound amplifying equipment" does not include standard vehicle radios when used and heard only by the occupants of the vehicle in which the vehicle radio is installed. The term "sound amplifying equipment," as used in this chapter, does not include warning devices on any vehicle used only for traffic safety purposes and shall not include communications equipment used by public or private utilities when restoring utility service following a public emergency or when doing work required to protect person or property from an imminent exposure to danger.

Sound level (noise level) in decibels is the value of a sound measurement using the "A" weighting network of a sound level meter. Slow response of the sound level meter needle shall be used except where the sound is impulsive or rapidly varying in nature, in which case, fast response shall be used.

Sound level meter means an instrument, including a microphone, an amplifier, an output meter and frequency weighting networks, for the measurement of sound levels, which satisfies the pertinent requirements in American National Standards Institute's specification S1.4-1971 or the most recent revision for type S-2A general purpose sound level meters.

(b) *Supplementary definitions of technical terms.* Definitions of technical terms not defined in this section shall be obtained from the American National Standards Institute's Acoustical Terminology S1-1971 or the most recent revision thereof.

(Code 1972, § 7.34.020; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.030. - Measurement methods.

(a) Sound shall be measured with a sound level meter as defined in section 7.34.020.

(b) Unless otherwise provided, outdoor measurements shall be taken with the microphone located at any point

on the property line of the noise source but no closer than five feet from any wall or vertical obstruction and three to five feet above ground level whenever possible.

(c) Unless otherwise provided, indoor measurements shall be taken inside the structure with the microphone located at any point as follows:

(1) No less than three feet above floor level;

(2) No less than five feet from any wall or vertical obstruction; and

(3) Not under common possession and control with the building or portion of the building from which the sound is emanating.

(Code 1972, § 7.34.030; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.040. - Sound amplification.

No person shall amplify sound using sound amplifying equipment contrary to any of the following:

(1) The only amplified sound permitted shall be either music or the human voice, or both.

(2) The volume of amplified sound shall not exceed the noise levels set forth in this subsection when measured outdoors at or beyond the property line of the property from which the sound emanates.

Time Period	Maximum Noise Level
10:01 p.m.—7:00 a.m.	60 dBA
7:01 a.m.—10:00 p.m.	80 dBA

(Code 1972, § 7.34.040; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.050. - General prohibition.

(a) It unlawful for any person to willfully make, cause or suffer, or permit to be made or caused, any loud excessive or offensive noises or sounds which unreasonably disturb the peace and quiet of any residential neighborhood or which are physically annoying to persons of ordinary sensitivity or which are so harsh, prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of the city, or any section thereof. The standards for dBA noise level in section 7.34.040 shall apply to this section. To the extent that the noise created causes the noise level at the property line to exceed the ambient noise level by more than 1.0 decibels, it shall be presumed that the noise being created also is in violation of this section.

(b) The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but not be limited to, the following:

(1) The level of the noise;

(2) Whether the nature of the noise is usual or unusual;

(3) Whether the origin of the noise is natural or unnatural;

(4) The level of the ambient noise;

(5) The proximity of the noise to sleeping facilities;

(6) The nature and zoning of the area from which the noise emanates and the area where it is received;

(7) The time of day or night the noise occurs;

(8) The duration of the noise; and

(9) Whether the noise is recurrent, intermittent or constant.

(Code 1972, § 7.34.050; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.060. - Construction noise.

It is unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect, construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dBA in residential zones in the city.

(Code 1972, § 7.34.060; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.070. - Refuse vehicles and parking lot sweepers.

No person shall operate or permit to be operated a refuse compacting, processing or collection vehicle or parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the city.

(Code 1972, § 7.34.070; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.080. - Disturbing, excessive, offensive noises; declaration of certain acts constituting.

The following activities, among others, are declared to cause loud, disturbing, excessive or offensive noises in violation of this section and are unlawful, namely:

(1) *Horns, signaling devices, etc.* Unnecessary use or operation of horns, signaling devices or other similar devices on automobiles, motorcycles or any other vehicle.

(2) *Radios, television sets, phonographs, loud speaking amplifiers and similar devices.* The use or operation of any sound production or reproduction device, radio receiving set, musical instrument, drums, phonograph, television set, loudspeakers, sound amplifier, or other similar machine or device for the producing or reproducing of sound, in such a manner as to disturb the peace, quiet or comfort of any reasonable person of normal sensitivity in any area of the city is prohibited. This provision shall not apply to any participant in a licensed parade or to any person who has been otherwise duly authorized by the city to engage in such conduct.

(3) *Animals.*

a. The keeping or maintenance, or the permitting to be kept or maintained, upon any premises owned, occupied or controlled by any person of any animal or animals which by any frequent or long-continued noise shall cause annoyance or discomfort to a reasonable person of normal sensitiveness in the vicinity.

b. The noise from any such animal or animals that disturbs two or more residents residing in separate residences adjacent to any part of the property on which the subject animal or animals are kept or maintained, or three or more residents residing in separate residences in close proximity to the

property on which the subject animal or animals are kept or maintained, shall be prima facie evidence of a violation of this section.

(4) *Hospitals, schools, libraries, rest homes, long-term medical or mental care facilities.* To make loud, disturbing, excessive noises adjacent to a hospital, school, library, rest home or long-term medical or mental care facility, which noise unreasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants in said institutions.

(5) *Playing of radios on buses and trolleys.* The operation of any radio, phonograph or tape player on an urban transit bus or trolley so as to emit noise that is audible to any other person in the vehicle is prohibited.

(6) *Playing of radios, phonographs and other sound production or reproduction devices in public parks and public parking lots and streets adjacent thereto.* The operation of any radio, phonograph, television set or any other sound production or reproduction device in any public park or any public parking lot, or street adjacent to such park or beach, without the prior written approval of the city manager or the administrator, in such a manner that such radio, phonograph, television set or sound production or reproduction device emits a sound level exceeding those found in the table in section 7.34.040.

(7) *Leaf blowers.*

a. The term "leaf blower" means any portable, hand-held or backpack, engine-powered device with a nozzle that creates a directable airstream which is capable of and intended for moving leaves and light materials.

b. No person shall operate a leaf blower in any residential zoned area between the hours of 7:00 p.m. and 8:00 a.m. on weekdays and 5:00 p.m. and 9:00 a.m. on weekends or on legal holidays.

c. No person may operate any leaf blower at a sound level in excess of 80 decibels measured at a distance of 50 feet or greater from the point of noise origin.

d. Leaf blowers shall be equipped with functional mufflers and an approved sound limiting device required to ensure that the leaf blower is not capable of generating a sound level exceeding any limit prescribed in this section.

(Code 1972, § 7.34.080; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.090. - Burglar alarms.

(a) Audible burglar alarms for structures or motor vehicles are prohibited unless the operation of such burglar alarm can be terminated within 20 minutes of being activated.

(b) Notwithstanding the requirements of this provision, any member of the county sheriff's department, Perris Division, shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed in any building, dwelling or motor vehicle at any time during the period of its activation. On or after 30 days from the effective date of the ordinance codified in this chapter, any building, dwelling or motor vehicle upon which a burglar alarm has been installed shall prominently display the telephone number at which communication may be made with the owner of such building, dwelling or motor vehicle.

(Code 1972, § 7.34.090; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.100. - Motor vehicles.

(a) Off-highway.

(1) Except as otherwise provided for in this chapter, it shall be unlawful to operate any motor vehicle of any

type on any site, other than on a public street or highway as defined in the California Vehicle Code, in any manner so as to cause noise in excess of those noise levels permitted for on-highway motor vehicles as specified in the table for "45-mile-per-hour or less speed limits" contained in section 23130 of the California Vehicle Code and as corrected for distances set forth in subsection (a)(2) of this section.

(2) The maximum noise level as the on-highway vehicle passes may be measured at a distance of other than 50 feet from the centerline of travel, provided the measurement is further adjusted by adding algebraically the application correction as follows:

Distance (feet)	Correction (decibels)
25	−6
28	−5
32	−4
35	−3
40	−2
45	−1
50 (preferred distance)	0
56	+1
63	+2
70	+3
80	+4
90	+5
100	+6

(b) Nothing in this section shall apply to authorized emergency vehicles when being used in emergency situations including the blowing of sirens and/or horns.

(Code 1972, § 7.34.100; Ord. No. 1082, § 2(part), 2000)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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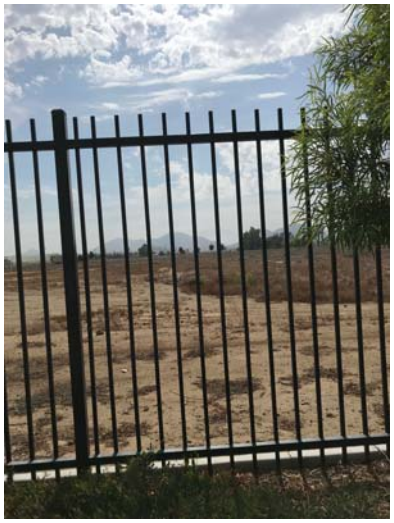

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L2_N
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L2_S
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L2_W
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L3_E
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L3_N
33, 50' 48.430000", 117, 13' 49.580000"

L3_S
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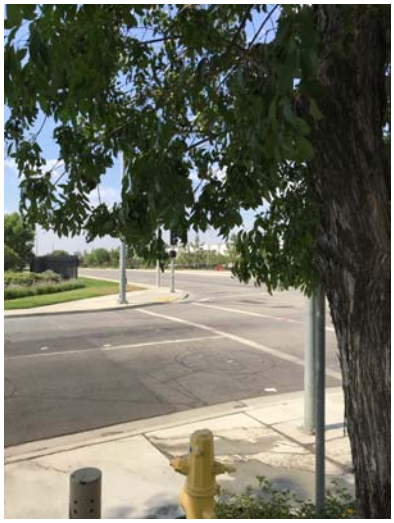

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L5_NE
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L5_NW
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L5_S
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L5_SE
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L5_W
33, 50' 44.350000", 117, 14' 25.370000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

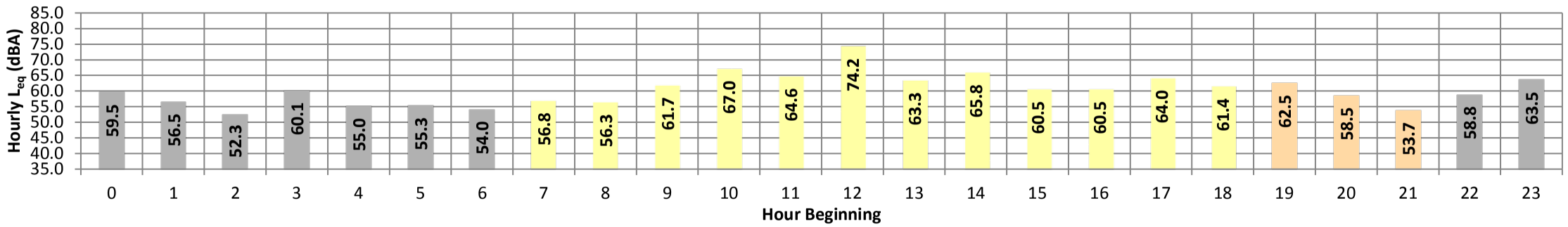
Date: Thursday, July 19, 2018
Project: Indian and Ramona Warehouse

Location: L1 - Located adjacent to the northern Project site boundary west of Indian Avenue.

Meter: Piccolo I

JN: 11706
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.5	86.1	43.0	71.0	66.0	59.0	56.0	51.0	46.0	44.0	44.0	43.0	59.5	10.0	69.5
	1	56.5	83.1	43.2	68.0	66.0	58.0	57.0	53.0	47.0	44.0	44.0	43.0	56.5	10.0	66.5
	2	52.3	76.7	42.3	63.0	59.0	57.0	53.0	47.0	45.0	44.0	43.0	43.0	52.3	10.0	62.3
	3	60.1	85.8	43.2	72.0	67.0	63.0	62.0	53.0	49.0	45.0	45.0	44.0	60.1	10.0	70.1
	4	55.0	80.9	44.4	67.0	62.0	56.0	53.0	49.0	47.0	45.0	45.0	44.0	55.0	10.0	65.0
	5	55.3	77.1	43.9	63.0	60.0	58.0	57.0	55.0	52.0	47.0	46.0	45.0	55.3	10.0	65.3
	6	54.0	73.9	47.7	63.0	60.0	57.0	55.0	53.0	51.0	49.0	49.0	48.0	54.0	10.0	64.0
Day	7	56.8	80.4	46.3	68.0	65.0	58.0	57.0	54.0	51.0	48.0	47.0	47.0	56.8	0.0	56.8
	8	56.3	78.0	46.3	69.0	64.0	61.0	61.0	51.0	49.0	47.0	47.0	46.0	56.3	0.0	56.3
	9	61.7	85.0	44.1	74.0	69.0	67.0	61.0	52.0	48.0	46.0	45.0	44.0	61.7	0.0	61.7
	10	67.0	88.2	45.2	76.0	73.0	73.0	73.0	59.0	55.0	48.0	47.0	46.0	67.0	0.0	67.0
	11	64.6	84.9	45.3	78.0	73.0	66.0	66.0	58.0	55.0	48.0	47.0	46.0	64.6	0.0	64.6
	12	74.2	99.5	44.6	84.0	72.0	65.0	62.0	55.0	49.0	46.0	46.0	45.0	74.2	0.0	74.2
	13	63.3	85.2	46.6	74.0	72.0	66.0	65.0	57.0	53.0	49.0	49.0	47.0	63.3	0.0	63.3
	14	65.8	88.2	47.5	79.0	74.0	68.0	65.0	58.0	54.0	50.0	49.0	48.0	65.8	0.0	65.8
	15	60.5	81.7	48.2	73.0	70.0	64.0	62.0	55.0	53.0	50.0	49.0	48.0	60.5	0.0	60.5
	16	60.5	79.7	46.7	73.0	70.0	65.0	64.0	56.0	53.0	49.0	49.0	48.0	60.5	0.0	60.5
	17	64.0	89.2	47.0	74.0	71.0	65.0	64.0	58.0	54.0	50.0	49.0	48.0	64.0	0.0	64.0
	18	61.4	82.7	46.7	72.0	67.0	63.0	62.0	58.0	55.0	50.0	49.0	48.0	61.4	0.0	61.4
Evening	19	62.5	86.6	44.7	75.0	71.0	66.0	62.0	54.0	49.0	46.0	45.0	45.0	62.5	5.0	67.5
	20	58.5	78.3	44.6	69.0	67.0	66.0	64.0	54.0	50.0	47.0	46.0	45.0	58.5	5.0	63.5
	21	53.7	74.4	44.5	64.0	60.0	59.0	56.0	50.0	48.0	46.0	46.0	45.0	53.7	5.0	58.7
Night	22	58.8	83.8	43.9	71.0	67.0	61.0	59.0	51.0	48.0	46.0	45.0	44.0	58.8	10.0	68.8
	23	63.5	93.1	41.6	71.0	68.0	64.0	64.0	53.0	47.0	44.0	43.0	42.0	63.5	10.0	73.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	56.3	78.0	44.1	68.0	64.0	58.0	57.0	51.0	48.0	46.0	45.0	44.0
	Max	74.2	99.5	48.2	84.0	74.0	73.0	73.0	59.0	55.0	50.0	49.0	48.0
Energy Average		66.1	Average:		74.5	70.0	65.1	63.5	55.9	52.4	48.4	47.8	46.8
Evening	Min	53.7	74.4	44.5	64.0	60.0	59.0	56.0	50.0	48.0	46.0	45.0	45.0
	Max	62.5	86.6	44.7	75.0	71.0	66.0	64.0	54.0	50.0	47.0	46.0	45.0
Energy Average		59.6	Average:		69.3	66.0	63.7	60.7	52.7	49.0	46.3	45.7	45.0
Night	Min	52.3	73.9	41.6	63.0	59.0	56.0	53.0	47.0	45.0	44.0	43.0	42.0
	Max	63.5	93.1	47.7	72.0	68.0	64.0	64.0	55.0	52.0	49.0	49.0	48.0
Energy Average		58.5	Average:		67.7	63.9	59.2	57.3	51.7	48.0	45.3	44.9	44.0

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
63.8	**65.3**	**58.5**

24-Hour CNEL (dBA)

67.0

24-Hour Noise Level Measurement Summary

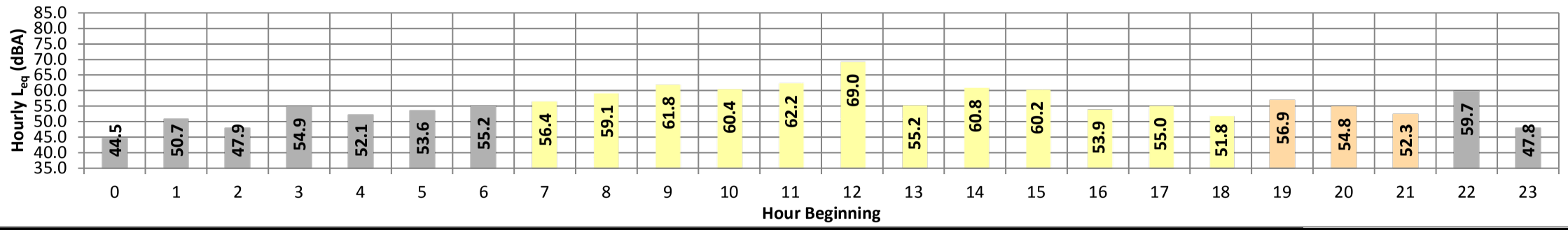
Date: Thursday, July 19, 2018
Project: Indian and Ramona Warehouse

Location: L2 - Located east of the Project site on Perry Street adjacent to existing residential homes and an industrial warehouse use.

Meter: Piccolo I

JN: 11706
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	44.5	65.6	40.8	49.0	48.0	46.0	46.0	44.0	43.0	42.0	42.0	42.0	44.5	10.0	54.5
	1	50.7	81.5	40.7	50.0	48.0	46.0	46.0	44.0	43.0	42.0	41.0	40.0	50.7	10.0	60.7
	2	47.9	78.5	40.5	50.0	48.0	46.0	46.0	44.0	43.0	41.0	40.0	40.0	47.9	10.0	57.9
	3	54.9	85.4	41.5	63.0	57.0	54.0	53.0	48.0	45.0	43.0	42.0	42.0	54.9	10.0	64.9
	4	52.1	83.1	42.7	54.0	52.0	50.0	49.0	47.0	46.0	44.0	44.0	43.0	52.1	10.0	62.1
	5	53.6	81.7	42.9	62.0	58.0	55.0	53.0	50.0	48.0	46.0	45.0	44.0	53.6	10.0	63.6
	6	55.2	77.8	45.0	66.0	61.0	57.0	54.0	51.0	50.0	48.0	47.0	46.0	55.2	10.0	65.2
Day	7	56.4	83.5	45.3	65.0	58.0	54.0	53.0	51.0	49.0	47.0	47.0	46.0	56.4	0.0	56.4
	8	59.1	82.8	44.9	71.0	65.0	57.0	55.0	53.0	52.0	47.0	46.0	45.0	59.1	0.0	59.1
	9	61.8	91.3	41.8	72.0	65.0	56.0	54.0	50.0	48.0	45.0	44.0	42.0	61.8	0.0	61.8
	10	60.4	83.2	42.9	75.0	69.0	59.0	56.0	51.0	48.0	45.0	44.0	43.0	60.4	0.0	60.4
	11	62.2	88.9	41.7	74.0	68.0	62.0	58.0	53.0	51.0	46.0	44.0	43.0	62.2	0.0	62.2
	12	69.0	92.6	41.9	83.0	71.0	60.0	55.0	50.0	48.0	44.0	43.0	42.0	69.0	0.0	69.0
	13	55.2	77.0	42.8	67.0	64.0	59.0	56.0	51.0	48.0	45.0	44.0	43.0	55.2	0.0	55.2
	14	60.8	86.7	43.6	72.0	68.0	63.0	60.0	53.0	50.0	47.0	46.0	44.0	60.8	0.0	60.8
	15	60.2	88.5	44.2	69.0	66.0	61.0	59.0	53.0	50.0	47.0	46.0	45.0	60.2	0.0	60.2
	16	53.9	75.5	44.8	65.0	61.0	57.0	55.0	50.0	49.0	46.0	46.0	45.0	53.9	0.0	53.9
	17	55.0	84.0	44.6	66.0	58.0	53.0	52.0	49.0	48.0	46.0	46.0	45.0	55.0	0.0	55.0
	18	51.8	77.8	43.0	60.0	58.0	54.0	52.0	49.0	47.0	45.0	45.0	44.0	51.8	0.0	51.8
Evening	19	56.9	83.7	42.9	67.0	63.0	58.0	55.0	50.0	47.0	45.0	44.0	43.0	56.9	5.0	61.9
	20	54.8	80.6	43.1	65.0	61.0	55.0	53.0	48.0	47.0	45.0	44.0	43.0	54.8	5.0	59.8
	21	52.3	77.1	41.7	60.0	57.0	54.0	52.0	48.0	46.0	43.0	43.0	42.0	52.3	5.0	57.3
Night	22	59.7	89.7	41.8	66.0	62.0	56.0	53.0	48.0	46.0	43.0	43.0	42.0	59.7	10.0	69.7
	23	47.8	66.2	42.2	54.0	53.0	51.0	50.0	47.0	46.0	44.0	43.0	43.0	47.8	10.0	57.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.8	75.5	41.7	60.0	58.0	53.0	52.0	49.0	47.0	44.0	43.0	42.0
	Max	69.0	92.6	45.3	83.0	71.0	63.0	60.0	53.0	52.0	47.0	47.0	46.0
Energy Average		61.4	Average:		69.9	64.3	57.9	55.4	51.1	49.0	45.8	45.1	43.9
Evening	Min	52.3	77.1	41.7	60.0	57.0	54.0	52.0	48.0	46.0	43.0	43.0	42.0
	Max	56.9	83.7	43.1	67.0	63.0	58.0	55.0	50.0	47.0	45.0	44.0	43.0
Energy Average		55.1	Average:		64.0	60.3	55.7	53.3	48.7	46.7	44.3	43.7	42.7
Night	Min	44.5	65.6	40.5	49.0	48.0	46.0	46.0	44.0	43.0	41.0	40.0	40.0
	Max	59.7	89.7	45.0	66.0	62.0	57.0	54.0	51.0	50.0	48.0	47.0	46.0
Energy Average		53.9	Average:		57.1	54.1	51.2	50.0	47.0	45.6	43.7	43.0	42.4

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
59.2	60.7	53.9
24-Hour CNEL (dBA)		
62.4		

24-Hour Noise Level Measurement Summary

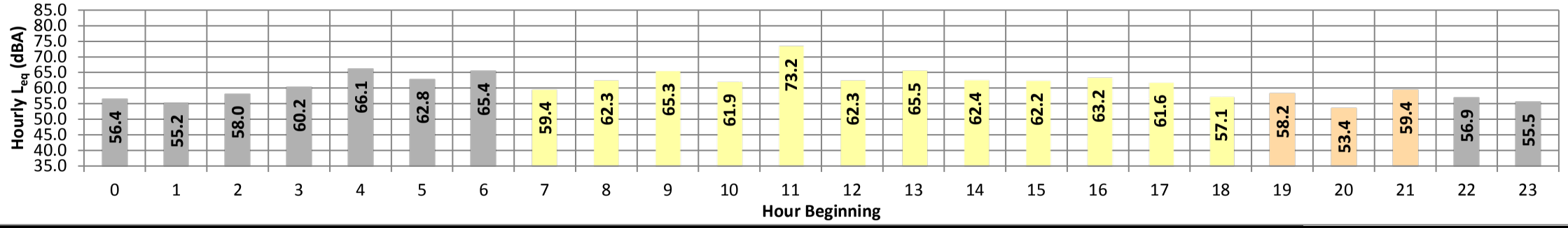
Date: Thursday, July 19, 2018
Project: Indian and Ramona Warehouse

Location: L3 - Located east of the Project site across Indian Avenue adjacent to an existing residential home.

Meter: Piccolo I

JN: 11706
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	56.4	82.2	39.1	69.0	64.0	57.0	52.0	45.0	43.0	40.0	40.0	39.0	56.4	10.0	66.4
	1	55.2	78.2	39.0	68.0	63.0	57.0	53.0	44.0	42.0	40.0	39.0	39.0	55.2	10.0	65.2
	2	58.0	80.9	39.1	70.0	66.0	62.0	59.0	52.0	47.0	42.0	41.0	40.0	58.0	10.0	68.0
	3	60.2	80.9	42.7	73.0	70.0	65.0	63.0	56.0	50.0	45.0	44.0	43.0	60.2	10.0	70.2
	4	66.1	96.9	43.1	73.0	71.0	67.0	65.0	59.0	53.0	47.0	46.0	44.0	66.1	10.0	76.1
	5	62.8	83.2	45.6	74.0	72.0	68.0	66.0	60.0	54.0	48.0	47.0	46.0	62.8	10.0	72.8
	6	65.4	80.5	45.4	74.0	73.0	72.0	70.0	65.0	60.0	48.0	47.0	46.0	65.4	10.0	75.4
Day	7	59.4	80.8	44.4	72.0	69.0	64.0	62.0	54.0	49.0	46.0	46.0	45.0	59.4	0.0	59.4
	8	62.3	86.8	42.1	74.0	70.0	65.0	61.0	54.0	49.0	45.0	44.0	43.0	62.3	0.0	62.3
	9	65.3	88.7	42.6	77.0	74.0	68.0	65.0	55.0	49.0	45.0	44.0	43.0	65.3	0.0	65.3
	10	61.9	85.0	41.7	74.0	71.0	67.0	64.0	55.0	49.0	44.0	43.0	42.0	61.9	0.0	61.9
	11	73.2	97.7	42.0	85.0	76.0	68.0	64.0	55.0	49.0	44.0	44.0	43.0	73.2	0.0	73.2
	12	62.3	83.0	42.9	74.0	72.0	67.0	65.0	58.0	52.0	46.0	45.0	43.0	62.3	0.0	62.3
	13	65.5	86.5	43.0	77.0	75.0	70.0	67.0	60.0	54.0	46.0	45.0	44.0	65.5	0.0	65.5
	14	62.4	83.7	43.6	75.0	71.0	66.0	64.0	58.0	52.0	47.0	46.0	45.0	62.4	0.0	62.4
	15	62.2	83.0	43.8	74.0	71.0	66.0	64.0	58.0	52.0	47.0	46.0	45.0	62.2	0.0	62.2
	16	63.2	85.7	43.8	77.0	73.0	66.0	63.0	56.0	51.0	47.0	46.0	45.0	63.2	0.0	63.2
	17	61.6	83.5	43.0	74.0	71.0	65.0	62.0	56.0	50.0	45.0	45.0	44.0	61.6	0.0	61.6
	18	57.1	76.3	41.6	70.0	67.0	62.0	59.0	52.0	47.0	43.0	43.0	42.0	57.1	0.0	57.1
Evening	19	58.2	83.0	41.2	70.0	66.0	62.0	59.0	51.0	46.0	43.0	43.0	42.0	58.2	5.0	63.2
	20	53.4	75.3	40.7	64.0	62.0	58.0	56.0	49.0	45.0	42.0	42.0	41.0	53.4	5.0	58.4
	21	59.4	80.9	40.5	72.0	69.0	63.0	61.0	53.0	48.0	43.0	42.0	41.0	59.4	5.0	64.4
Night	22	56.9	80.3	39.1	70.0	66.0	61.0	59.0	51.0	46.0	42.0	41.0	40.0	56.9	10.0	66.9
	23	55.5	80.1	39.0	68.0	63.0	58.0	55.0	46.0	43.0	40.0	40.0	39.0	55.5	10.0	65.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	57.1	76.3	41.6	70.0	67.0	62.0	59.0	52.0	47.0	43.0	43.0	42.0
	Max	73.2	97.7	44.4	85.0	76.0	70.0	67.0	60.0	54.0	47.0	46.0	45.0
Energy Average		65.3	Average:		75.3	71.7	66.2	63.3	55.9	50.3	45.4	44.8	43.7
Evening	Min	53.4	75.3	40.5	64.0	62.0	58.0	56.0	49.0	45.0	42.0	42.0	41.0
	Max	59.4	83.0	41.2	72.0	69.0	63.0	61.0	53.0	48.0	43.0	43.0	42.0
Energy Average		57.7	Average:		68.7	65.7	61.0	58.7	51.0	46.3	42.7	42.3	41.3
Night	Min	55.2	78.2	39.0	68.0	63.0	57.0	52.0	44.0	42.0	40.0	39.0	39.0
	Max	66.1	96.9	45.6	74.0	73.0	72.0	70.0	65.0	60.0	48.0	47.0	46.0
Energy Average		61.5	Average:		71.0	67.6	63.0	60.2	53.1	48.7	43.6	42.8	41.8

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
63.6	64.6	61.5

24-Hour CNEL (dBA)
68.6

24-Hour Noise Level Measurement Summary

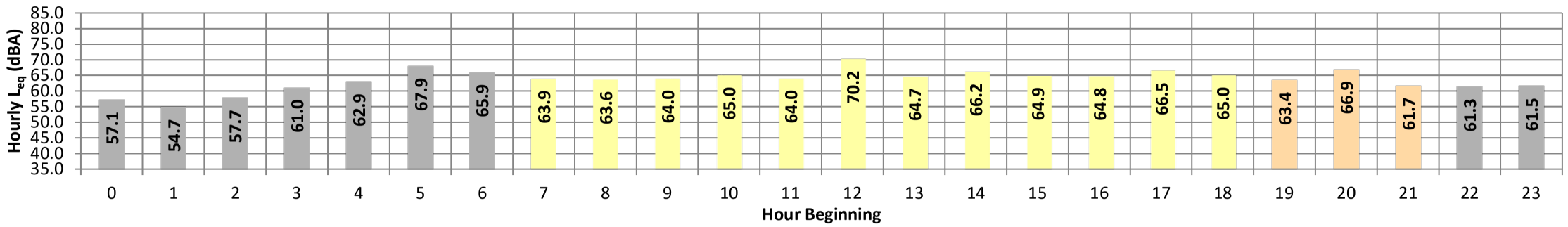
Date: Thursday, July 19, 2018
Project: Indian and Ramona Warehouse

Location: L4 - Located southeast of the Project site on Perris Boulevard near existing commercial uses and a mobile home park.

Meter: Piccolo I

JN: 11706
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.1	76.1	43.0	68.0	66.0	62.0	60.0	55.0	50.0	45.0	44.0	44.0	57.1	10.0	67.1
	1	54.7	74.5	42.2	65.0	63.0	61.0	59.0	52.0	47.0	44.0	43.0	43.0	54.7	10.0	64.7
	2	57.7	83.5	41.5	68.0	66.0	62.0	60.0	52.0	47.0	43.0	43.0	42.0	57.7	10.0	67.7
	3	61.0	83.3	42.3	71.0	69.0	65.0	64.0	58.0	52.0	45.0	44.0	43.0	61.0	10.0	71.0
	4	62.9	82.8	44.5	73.0	71.0	68.0	66.0	62.0	58.0	49.0	48.0	46.0	62.9	10.0	72.9
	5	67.9	94.9	47.5	76.0	73.0	70.0	69.0	65.0	61.0	54.0	52.0	50.0	67.9	10.0	77.9
	6	65.9	88.5	47.9	75.0	73.0	70.0	68.0	64.0	59.0	52.0	51.0	49.0	65.9	10.0	75.9
Day	7	63.9	80.9	47.1	73.0	71.0	69.0	67.0	64.0	59.0	52.0	50.0	49.0	63.9	0.0	63.9
	8	63.6	88.0	44.5	72.0	70.0	67.0	66.0	63.0	59.0	50.0	49.0	47.0	63.6	0.0	63.6
	9	64.0	83.2	45.3	74.0	72.0	69.0	67.0	63.0	60.0	52.0	50.0	48.0	64.0	0.0	64.0
	10	65.0	87.4	44.4	76.0	72.0	68.0	67.0	63.0	59.0	52.0	50.0	47.0	65.0	0.0	65.0
	11	64.0	84.0	44.1	73.0	71.0	68.0	67.0	64.0	60.0	54.0	52.0	49.0	64.0	0.0	64.0
	12	70.2	91.2	46.4	83.0	78.0	71.0	69.0	66.0	65.0	55.0	52.0	48.0	70.2	0.0	70.2
	13	64.7	83.6	48.7	75.0	72.0	69.0	67.0	64.0	61.0	54.0	53.0	50.0	64.7	0.0	64.7
	14	66.2	86.1	48.2	76.0	74.0	71.0	69.0	65.0	62.0	55.0	53.0	50.0	66.2	0.0	66.2
	15	64.9	91.3	48.4	74.0	72.0	68.0	67.0	63.0	60.0	54.0	52.0	50.0	64.9	0.0	64.9
	16	64.8	85.0	48.4	74.0	72.0	69.0	67.0	63.0	60.0	54.0	52.0	51.0	64.8	0.0	64.8
	17	66.5	92.0	48.3	75.0	73.0	69.0	68.0	64.0	61.0	54.0	53.0	51.0	66.5	0.0	66.5
	18	65.0	86.9	50.1	76.0	73.0	69.0	67.0	63.0	60.0	54.0	53.0	51.0	65.0	0.0	65.0
Evening	19	63.4	82.0	48.9	72.0	70.0	68.0	67.0	63.0	60.0	54.0	52.0	50.0	63.4	5.0	68.4
	20	66.9	93.5	47.3	77.0	73.0	68.0	67.0	63.0	59.0	53.0	52.0	50.0	66.9	5.0	71.9
	21	61.7	80.9	45.2	71.0	69.0	66.0	65.0	61.0	57.0	50.0	49.0	47.0	61.7	5.0	66.7
Night	22	61.3	79.5	44.7	71.0	69.0	66.0	65.0	61.0	58.0	50.0	48.0	46.0	61.3	10.0	71.3
	23	61.5	88.1	43.3	68.0	66.0	64.0	63.0	58.0	54.0	47.0	46.0	44.0	61.5	10.0	71.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	63.6	80.9	44.1	72.0	70.0	67.0	66.0	63.0	59.0	50.0	49.0	47.0
	Max	70.2	92.0	50.1	83.0	78.0	71.0	69.0	66.0	65.0	55.0	53.0	51.0
Energy Average		65.7	Average:		75.1	72.5	68.9	67.3	63.8	60.5	53.3	51.6	49.3
Evening	Min	61.7	80.9	45.2	71.0	69.0	66.0	65.0	61.0	57.0	50.0	49.0	47.0
	Max	66.9	93.5	48.9	77.0	73.0	68.0	67.0	63.0	60.0	54.0	52.0	50.0
Energy Average		64.6	Average:		73.3	70.7	67.3	66.3	62.3	58.7	52.3	51.0	49.0
Night	Min	54.7	74.5	41.5	65.0	63.0	61.0	59.0	52.0	47.0	43.0	43.0	42.0
	Max	67.9	94.9	47.9	76.0	73.0	70.0	69.0	65.0	61.0	54.0	52.0	50.0
Energy Average		62.9	Average:		70.6	68.4	65.3	63.8	58.6	54.0	47.7	46.6	45.2

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
64.7	65.5	62.9

24-Hour CNEL (dBA)

70.1

24-Hour Noise Level Measurement Summary

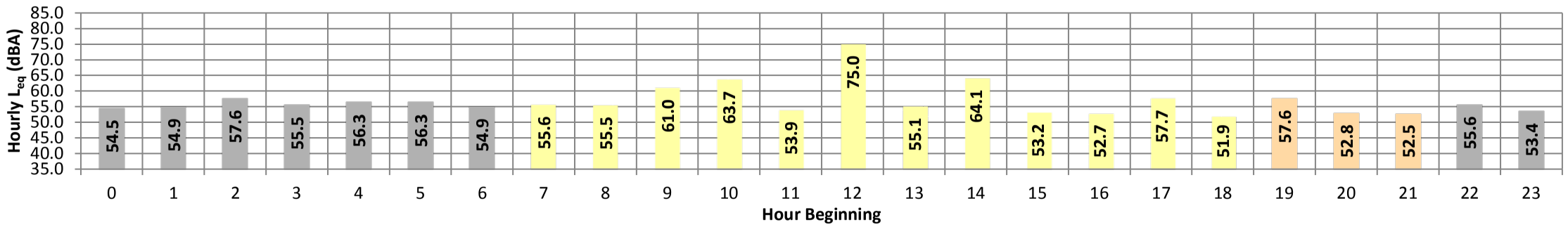
Date: Thursday, July 19, 2018
Project: Indian and Ramona Warehouse

Location: L5 - Located west of the Project site on Brennan Avenue adjacent to existing residential homes and an industrial warehouse use.

Meter: Piccolo I

JN: 11706
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	54.5	62.1	52.1	57.0	57.0	56.0	56.0	55.0	54.0	52.0	52.0	52.0	54.5	10.0	64.5
	1	54.9	68.5	51.8	59.0	57.0	56.0	56.0	55.0	54.0	53.0	52.0	52.0	54.9	10.0	64.9
	2	57.6	66.6	52.4	64.0	64.0	64.0	63.0	55.0	54.0	53.0	53.0	52.0	57.6	10.0	67.6
	3	55.5	70.7	50.6	64.0	64.0	59.0	56.0	54.0	53.0	51.0	51.0	51.0	55.5	10.0	65.5
	4	56.3	65.9	51.0	60.0	59.0	58.0	58.0	56.0	55.0	54.0	53.0	52.0	56.3	10.0	66.3
	5	56.3	70.7	52.0	61.0	60.0	59.0	58.0	56.0	55.0	53.0	53.0	52.0	56.3	10.0	66.3
	6	54.9	69.8	47.9	61.0	60.0	58.0	57.0	55.0	53.0	50.0	49.0	48.0	54.9	10.0	64.9
Day	7	55.6	69.2	50.8	62.0	60.0	58.0	58.0	56.0	54.0	52.0	52.0	51.0	55.6	0.0	55.6
	8	55.5	69.6	49.4	61.0	59.0	58.0	58.0	56.0	54.0	52.0	51.0	50.0	55.5	0.0	55.5
	9	61.0	87.3	48.7	62.0	60.0	57.0	56.0	54.0	53.0	51.0	51.0	50.0	61.0	0.0	61.0
	10	63.7	88.5	48.1	74.0	63.0	59.0	58.0	54.0	53.0	50.0	50.0	49.0	63.7	0.0	63.7
	11	53.9	74.7	44.9	60.0	59.0	57.0	55.0	52.0	50.0	48.0	47.0	46.0	53.9	0.0	53.9
	12	75.0	98.5	45.4	85.0	68.0	58.0	56.0	52.0	50.0	48.0	47.0	46.0	75.0	0.0	75.0
	13	55.1	75.7	44.3	66.0	62.0	56.0	55.0	52.0	50.0	47.0	46.0	45.0	55.1	0.0	55.1
	14	64.1	89.7	45.0	76.0	72.0	65.0	59.0	53.0	50.0	47.0	46.0	45.0	64.1	0.0	64.1
	15	53.2	70.0	46.1	62.0	59.0	56.0	55.0	53.0	51.0	48.0	48.0	46.0	53.2	0.0	53.2
	16	52.7	70.1	47.1	60.0	58.0	55.0	54.0	52.0	51.0	49.0	48.0	47.0	52.7	0.0	52.7
	17	57.7	81.4	46.2	63.0	60.0	56.0	55.0	52.0	51.0	48.0	48.0	47.0	57.7	0.0	57.7
	18	51.9	69.4	44.5	59.0	57.0	55.0	54.0	51.0	49.0	47.0	46.0	45.0	51.9	0.0	51.9
Evening	19	57.6	82.9	44.1	70.0	65.0	57.0	55.0	52.0	50.0	47.0	46.0	45.0	57.6	5.0	62.6
	20	52.8	70.3	43.7	63.0	62.0	56.0	54.0	51.0	49.0	46.0	45.0	44.0	52.8	5.0	57.8
	21	52.5	65.9	44.4	59.0	58.0	56.0	55.0	53.0	51.0	48.0	47.0	45.0	52.5	5.0	57.5
Night	22	55.6	73.1	48.6	66.0	62.0	58.0	57.0	54.0	52.0	50.0	50.0	49.0	55.6	10.0	65.6
	23	53.4	74.0	47.2	61.0	59.0	56.0	55.0	52.0	51.0	49.0	48.0	47.0	53.4	10.0	63.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.9	69.2	44.3	59.0	57.0	55.0	54.0	51.0	49.0	47.0	46.0	45.0
	Max	75.0	98.5	50.8	85.0	72.0	65.0	59.0	56.0	54.0	52.0	52.0	51.0
Energy Average		65.3	Average:		65.8	61.4	57.5	56.1	53.1	51.3	48.9	48.3	47.3
Evening	Min	52.5	65.9	43.7	59.0	58.0	56.0	54.0	51.0	49.0	46.0	45.0	44.0
	Max	57.6	82.9	44.4	70.0	65.0	57.0	55.0	53.0	51.0	48.0	47.0	45.0
Energy Average		55.0	Average:		64.0	61.7	56.3	54.7	52.0	50.0	47.0	46.0	44.7
Night	Min	53.4	62.1	47.2	57.0	57.0	56.0	55.0	52.0	51.0	49.0	48.0	47.0
	Max	57.6	74.0	52.4	66.0	64.0	64.0	63.0	56.0	55.0	54.0	53.0	52.0
Energy Average		55.6	Average:		61.4	60.2	58.2	57.3	54.7	53.4	51.7	51.2	50.6

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
62.7	64.4	55.6

24-Hour CNEL (dBA)
65.0

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,798 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.02	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.36	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.13	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	61.2	60.1	58.3	65.2	65.5
Medium Trucks:	63.9	61.4	58.5	57.9	64.9	65.2
Heavy Trucks:	69.4	66.7	64.0	64.1	70.9	71.1
Vehicle Noise:	71.3	68.7	66.3	65.8	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	153	330	711
CNEL:	74	159	343	740

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Indian Av.
Road Segment: n/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,798 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.02	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.36	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.13	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	61.2	60.1	58.3	65.2	65.5
Medium Trucks:	63.9	61.4	58.5	57.9	64.9	65.2
Heavy Trucks:	69.4	66.7	64.0	64.1	70.9	71.1
Vehicle Noise:	71.3	68.7	66.3	65.8	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	153	330	711
CNEL:	74	159	343	740

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,187 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	719 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.37	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.71	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.48	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.6	60.8	59.7	57.9	64.8	65.2
Medium Trucks:	63.5	61.1	58.1	57.6	64.6	64.8
Heavy Trucks:	69.0	66.3	63.7	63.7	70.5	70.7
Vehicle Noise:	71.0	68.3	65.9	65.5	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	145	312	673
CNEL:	70	151	325	701

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,187 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	719 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.37	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.71	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.48	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.6	60.8	59.7	57.9	64.8	65.2
Medium Trucks:	63.5	61.1	58.1	57.6	64.6	64.8
Heavy Trucks:	69.0	66.3	63.7	63.7	70.5	70.7
Vehicle Noise:	71.0	68.3	65.9	65.5	72.3	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	145	312	673
CNEL:	70	151	325	701

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,427 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,843 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.53	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.81	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.58	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.2	68.5	67.3	65.5	72.4	72.8
Medium Trucks:	70.5	68.1	65.1	64.6	71.6	71.8
Heavy Trucks:	74.7	72.1	69.4	69.4	76.2	76.5
Vehicle Noise:	77.3	74.7	72.4	71.8	78.7	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	349	751	1,618	3,486
CNEL:	363	783	1,686	3,632

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,081 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,408 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.12	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-8.22	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.99	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.8	68.0	66.9	65.1	72.0	72.4
Medium Trucks:	70.1	67.7	64.7	64.2	71.2	71.4
Heavy Trucks:	74.3	71.7	69.0	69.0	75.8	76.0
Vehicle Noise:	76.9	74.3	72.0	71.4	78.3	78.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	327	705	1,520	3,274
CNEL:	341	735	1,583	3,412

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,113 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	811 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	85.03%
Medium Trucks:	68.4%	8.7%	22.9%	6.52%
Heavy Trucks:	64.8%	8.7%	26.4%	8.45%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.94	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.09	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-12.97	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	61.3	60.2	58.4	65.3	65.6
Medium Trucks:	64.1	61.7	58.8	58.2	65.2	65.5
Heavy Trucks:	70.5	67.9	65.2	65.2	72.0	72.3
Vehicle Noise:	72.2	69.5	67.1	66.7	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	81	174	376	809
CNEL:	84	181	391	842

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Indian Av.
Road Segment: n/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,920 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	792 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.10%
Medium Trucks:	68.4%	8.7%	22.9%	6.28%
Heavy Trucks:	64.8%	8.7%	26.4%	6.62%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.94	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.36	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.13	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	61.3	60.2	58.4	65.3	65.6
Medium Trucks:	63.9	61.4	58.5	57.9	64.9	65.2
Heavy Trucks:	69.4	66.7	64.0	64.1	70.9	71.1
Vehicle Noise:	71.3	68.7	66.3	65.9	72.7	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	153	331	712
CNEL:	74	160	344	741

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,309 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	731 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.11%
Medium Trucks:	68.4%	8.7%	22.9%	6.27%
Heavy Trucks:	64.8%	8.7%	26.4%	6.61%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.29	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.71	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.48	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.7	60.9	59.8	58.0	64.9	65.3
Medium Trucks:	63.5	61.1	58.1	57.6	64.6	64.8
Heavy Trucks:	69.0	66.3	63.7	63.7	70.5	70.7
Vehicle Noise:	71.0	68.3	65.9	65.5	72.4	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	145	313	675
CNEL:	70	151	326	702

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,268 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	727 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.04%
Medium Trucks:	68.4%	8.7%	22.9%	6.31%
Heavy Trucks:	64.8%	8.7%	26.4%	6.65%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.31	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.71	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.48	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.7	60.9	59.8	58.0	64.9	65.2
Medium Trucks:	63.5	61.1	58.1	57.6	64.6	64.8
Heavy Trucks:	69.0	66.3	63.7	63.7	70.5	70.7
Vehicle Noise:	71.0	68.3	65.9	65.5	72.4	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	145	313	674
CNEL:	70	151	326	702

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,753 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,875 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.98%
Medium Trucks:	68.4%	8.7%	22.9%	6.34%
Heavy Trucks:	64.8%	8.7%	26.4%	6.68%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.57	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.81	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.58	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.3	68.5	67.4	65.6	72.5	72.8
Medium Trucks:	70.5	68.1	65.1	64.6	71.6	71.8
Heavy Trucks:	74.7	72.1	69.4	69.4	76.2	76.5
Vehicle Noise:	77.3	74.7	72.4	71.8	78.7	79.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	349	752	1,620	3,490
CNEL:	364	784	1,688	3,637

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,142 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,414 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.91%
Medium Trucks:	68.4%	8.7%	22.9%	6.37%
Heavy Trucks:	64.8%	8.7%	26.4%	6.72%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.13	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-8.22	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.99	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.8	68.1	66.9	65.1	72.0	72.4
Medium Trucks:	70.1	67.7	64.7	64.2	71.2	71.4
Heavy Trucks:	74.3	71.7	69.0	69.0	75.8	76.0
Vehicle Noise:	76.9	74.3	72.0	71.4	78.3	78.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	328	706	1,520	3,275
CNEL:	341	735	1,584	3,412

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,273 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	827 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.76	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.10	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.87	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.2	61.5	60.3	58.5	65.5	65.8
Medium Trucks:	64.1	61.7	58.7	58.2	65.2	65.4
Heavy Trucks:	69.6	67.0	64.3	64.3	71.1	71.4
Vehicle Noise:	71.6	68.9	66.5	66.1	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	74	159	343	739
CNEL:	77	166	357	770

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Indian Av.
Road Segment: n/o Perry St.
Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,273 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	827 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.76	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.10	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.87	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.2	61.5	60.3	58.5	65.5	65.8
Medium Trucks:	64.1	61.7	58.7	58.2	65.2	65.4
Heavy Trucks:	69.6	67.0	64.3	64.3	71.1	71.4
Vehicle Noise:	71.6	68.9	66.5	66.1	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	74	159	343	739
CNEL:	77	166	357	770

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,625 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	763 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.11	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.46	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.23	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	61.1	60.0	58.2	65.1	65.4
Medium Trucks:	63.8	61.3	58.4	57.8	64.8	65.1
Heavy Trucks:	69.3	66.6	63.9	64.0	70.8	71.0
Vehicle Noise:	71.2	68.6	66.2	65.7	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	70	151	325	700
CNEL:	73	157	338	729

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,625 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	763 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.11	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.46	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.23	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	61.1	60.0	58.2	65.1	65.4
Medium Trucks:	63.8	61.3	58.4	57.8	64.8	65.1
Heavy Trucks:	69.3	66.6	63.9	64.0	70.8	71.0
Vehicle Noise:	71.2	68.6	66.2	65.7	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	70	151	325	700
CNEL:	73	157	338	729

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,376 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,138 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.79	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.55	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.32	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	68.7	67.6	65.8	72.7	73.1
Medium Trucks:	70.8	68.3	65.4	64.8	71.8	72.1
Heavy Trucks:	75.0	72.3	69.6	69.7	76.5	76.7
Vehicle Noise:	77.6	75.0	72.6	72.1	78.9	79.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	363	781	1,683	3,626
CNEL:	378	814	1,754	3,778

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,766 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,677 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.38	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.96	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.73	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	68.3	67.2	65.4	72.3	72.6
Medium Trucks:	70.4	67.9	65.0	64.4	71.4	71.7
Heavy Trucks:	74.6	71.9	69.2	69.3	76.1	76.3
Vehicle Noise:	77.2	74.5	72.2	71.7	78.5	78.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	341	734	1,581	3,406
CNEL:	355	765	1,647	3,549

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,588 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	859 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	85.13%
Medium Trucks:	68.4%	8.7%	22.9%	6.52%
Heavy Trucks:	64.8%	8.7%	26.4%	8.35%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.69	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.85	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-12.77	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	61.5	60.4	58.6	65.5	65.9
Medium Trucks:	64.4	61.9	59.0	58.4	65.4	65.7
Heavy Trucks:	70.7	68.1	65.4	65.4	72.2	72.5
Vehicle Noise:	72.4	69.7	67.3	66.9	73.8	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	84	180	388	836
CNEL:	87	187	404	870

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Indian Av.
Road Segment: n/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,395 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	840 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.09%
Medium Trucks:	68.4%	8.7%	22.9%	6.29%
Heavy Trucks:	64.8%	8.7%	26.4%	6.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.69	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.10	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.87	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.3	61.5	60.4	58.6	65.5	65.9
Medium Trucks:	64.1	61.7	58.7	58.2	65.2	65.4
Heavy Trucks:	69.6	67.0	64.3	64.3	71.1	71.4
Vehicle Noise:	71.6	69.0	66.6	66.1	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	74	160	344	741
CNEL:	77	166	358	771

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,747 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	775 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.10%
Medium Trucks:	68.4%	8.7%	22.9%	6.28%
Heavy Trucks:	64.8%	8.7%	26.4%	6.62%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.03	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.46	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.23	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	61.2	60.1	58.3	65.2	65.5
Medium Trucks:	63.8	61.3	58.4	57.8	64.8	65.1
Heavy Trucks:	69.3	66.6	63.9	64.0	70.8	71.0
Vehicle Noise:	71.2	68.6	66.2	65.8	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	70	151	326	702
CNEL:	73	157	339	730

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,706 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	771 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.03%
Medium Trucks:	68.4%	8.7%	22.9%	6.31%
Heavy Trucks:	64.8%	8.7%	26.4%	6.66%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.06	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-14.46	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-14.23	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	61.2	60.0	58.2	65.1	65.5
Medium Trucks:	63.8	61.3	58.4	57.8	64.8	65.1
Heavy Trucks:	69.3	66.6	63.9	64.0	70.8	71.0
Vehicle Noise:	71.2	68.6	66.2	65.7	72.6	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	70	151	326	701
CNEL:	73	157	339	730

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,702 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,170 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.98%
Medium Trucks:	68.4%	8.7%	22.9%	6.34%
Heavy Trucks:	64.8%	8.7%	26.4%	6.68%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.82	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.55	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.32	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	68.7	67.6	65.8	72.7	73.1
Medium Trucks:	70.8	68.3	65.4	64.8	71.8	72.1
Heavy Trucks:	75.0	72.3	69.6	69.7	76.5	76.7
Vehicle Noise:	77.6	75.0	72.7	72.1	78.9	79.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	363	782	1,685	3,630
CNEL:	378	815	1,756	3,783

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,827 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,683 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.91%
Medium Trucks:	68.4%	8.7%	22.9%	6.37%
Heavy Trucks:	64.8%	8.7%	26.4%	6.72%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.39	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.96	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.73	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.1	68.3	67.2	65.4	72.3	72.6
Medium Trucks:	70.4	67.9	65.0	64.4	71.4	71.7
Heavy Trucks:	74.6	71.9	69.2	69.3	76.1	76.3
Vehicle Noise:	77.2	74.5	72.2	71.7	78.5	78.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	341	734	1,581	3,407
CNEL:	355	765	1,648	3,550

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,399 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	940 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.21	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.55	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.32	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	62.0	60.9	59.1	66.0	66.4
Medium Trucks:	64.7	62.2	59.3	58.7	65.7	66.0
Heavy Trucks:	70.2	67.5	64.8	64.9	71.7	71.9
Vehicle Noise:	72.1	69.5	67.1	66.6	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	81	173	374	805
CNEL:	84	181	389	838

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Indian Av.
Road Segment: n/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,399 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	940 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.21	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.55	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.32	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	62.0	60.9	59.1	66.0	66.4
Medium Trucks:	64.7	62.2	59.3	58.7	65.7	66.0
Heavy Trucks:	70.2	67.5	64.8	64.9	71.7	71.9
Vehicle Noise:	72.1	69.5	67.1	66.6	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	81	173	374	805
CNEL:	84	181	389	838

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,751 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	875 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.52	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.86	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.63	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	61.7	60.6	58.8	65.7	66.0
Medium Trucks:	64.4	61.9	59.0	58.4	65.4	65.7
Heavy Trucks:	69.9	67.2	64.5	64.6	71.4	71.6
Vehicle Noise:	71.8	69.2	66.8	66.3	73.2	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	165	356	768
CNEL:	80	172	371	799

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,751 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	875 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.52	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.86	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.63	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	61.7	60.6	58.8	65.7	66.0
Medium Trucks:	64.4	61.9	59.0	58.4	65.4	65.7
Heavy Trucks:	69.9	67.2	64.5	64.6	71.4	71.6
Vehicle Noise:	71.8	69.2	66.8	66.3	73.2	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	165	356	768
CNEL:	80	172	371	799

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	60,191 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,019 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	4.48	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-6.87	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-6.64	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	69.4	68.3	66.5	73.4	73.7
Medium Trucks:	71.5	69.0	66.1	65.5	72.5	72.8
Heavy Trucks:	75.7	73.0	70.3	70.4	77.2	77.4
Vehicle Noise:	78.3	75.6	73.3	72.8	79.6	79.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	403	868	1,871	4,030
CNEL:	420	905	1,949	4,199

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,310 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,331 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.90%
Medium Trucks:	68.4%	8.7%	22.9%	6.38%
Heavy Trucks:	64.8%	8.7%	26.4%	6.73%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.95	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.39	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.16	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.6	68.9	67.8	65.9	72.9	73.2
Medium Trucks:	70.9	68.5	65.5	65.0	72.0	72.2
Heavy Trucks:	75.1	72.5	69.8	69.8	76.6	76.9
Vehicle Noise:	77.8	75.1	72.8	72.2	79.1	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	372	801	1,725	3,717
CNEL:	387	834	1,797	3,872

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Indian Av.
Road Segment: n/o Dwy. 2

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,714 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	971 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	85.33%
Medium Trucks:	68.4%	8.7%	22.9%	6.50%
Heavy Trucks:	64.8%	8.7%	26.4%	8.17%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.14	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.32	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-12.33	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	62.1	61.0	59.1	66.1	66.4
Medium Trucks:	64.9	62.5	59.5	59.0	66.0	66.2
Heavy Trucks:	71.2	68.5	65.8	65.8	72.7	72.9
Vehicle Noise:	72.8	70.2	67.7	67.4	74.2	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	90	194	417	898
CNEL:	93	201	434	934

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Indian Av.
Road Segment: n/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,521 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	952 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.06%
Medium Trucks:	68.4%	8.7%	22.9%	6.30%
Heavy Trucks:	64.8%	8.7%	26.4%	6.64%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.14	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.55	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.32	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	62.1	61.0	59.1	66.1	66.4
Medium Trucks:	64.7	62.2	59.3	58.7	65.7	66.0
Heavy Trucks:	70.2	67.5	64.8	64.9	71.7	71.9
Vehicle Noise:	72.2	69.5	67.1	66.7	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	81	174	374	807
CNEL:	84	181	390	839

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Indian Av.
Road Segment: s/o Perry St.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,873 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	887 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.08%
Medium Trucks:	68.4%	8.7%	22.9%	6.29%
Heavy Trucks:	64.8%	8.7%	26.4%	6.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.45	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.86	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.63	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	61.8	60.7	58.8	65.8	66.1
Medium Trucks:	64.4	61.9	59.0	58.4	65.4	65.7
Heavy Trucks:	69.9	67.2	64.5	64.6	71.4	71.6
Vehicle Noise:	71.8	69.2	66.8	66.3	73.2	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	166	357	769
CNEL:	80	172	372	800

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Indian Av.
Road Segment: n/o Ramona Exwy.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,832 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	883 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	56 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	47.0 feet
Centerline Dist. to Observer:	47.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	87.02%
Medium Trucks:	68.4%	8.7%	22.9%	6.32%
Heavy Trucks:	64.8%	8.7%	26.4%	6.67%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	38.079
Medium Trucks:	37.846
Heavy Trucks:	37.869

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.47	1.67	-1.20	*-4.63*	0.000	0.000
Medium Trucks:	77.72	-13.86	1.71	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-13.63	1.71	-1.20	*-5.46*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.5	61.7	60.6	58.8	65.7	66.1
Medium Trucks:	64.4	61.9	59.0	58.4	65.4	65.7
Heavy Trucks:	69.9	67.2	64.5	64.6	71.4	71.6
Vehicle Noise:	71.8	69.2	66.8	66.3	73.2	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	77	166	357	769
CNEL:	80	172	371	800

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Ramona Exwy.
Road Segment: w/o Dwy. 1

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	60,517 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,052 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.97%
Medium Trucks:	68.4%	8.7%	22.9%	6.34%
Heavy Trucks:	64.8%	8.7%	26.4%	6.69%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	4.50	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-6.87	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-6.64	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	69.4	68.3	66.5	73.4	73.8
Medium Trucks:	71.5	69.0	66.1	65.5	72.5	72.8
Heavy Trucks:	75.7	73.0	70.3	70.4	77.2	77.4
Vehicle Noise:	78.3	75.6	73.3	72.8	79.6	79.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	403	869	1,872	4,034
CNEL:	420	906	1,951	4,203

Wednesday, August 15, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Ramona Exwy.
Road Segment: e/o Indian Av.

Project Name: Indian & Ramona
Job Number: 11706

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,371 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,337 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	102 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	92.0 feet
Centerline Dist. to Observer:	92.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	63.4%	12.3%	24.3%	86.91%
Medium Trucks:	68.4%	8.7%	22.9%	6.37%
Heavy Trucks:	64.8%	8.7%	26.4%	6.72%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.733
Medium Trucks:	76.618
Heavy Trucks:	76.629

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	3.95	-2.89	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-7.39	-2.88	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-7.16	-2.88	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.6	68.9	67.8	65.9	72.9	73.2
Medium Trucks:	70.9	68.5	65.5	65.0	72.0	72.2
Heavy Trucks:	75.1	72.5	69.8	69.8	76.6	76.9
Vehicle Noise:	77.8	75.1	72.8	72.2	79.1	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	372	801	1,726	3,717
CNEL:	387	834	1,798	3,873

Wednesday, August 15, 2018

APPENDIX 9.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R1**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	384.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	384.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	384.0	-22.1	-22.1	-22.1	-22.1	-22.1	-22.1
Shielding (Barrier Attenuation)	384.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		45.1	-22.1	-22.1	-22.1	-22.1	-22.1
60 Minute Hourly Adjustment		**45.1**	**-22.1**	**-22.1**	**-22.1**	**-22.1**	**-22.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R1**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	308.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	308.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	308.0	-35.8	-35.8	-35.8	-35.8	-35.8	-35.8
Shielding (Barrier Attenuation)	308.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		41.4	-35.8	-35.8	-35.8	-35.8	-35.8
39 Minute Hourly Adjustment		**39.5**	**-37.7**	**-37.7**	**-37.7**	**-37.7**	**-37.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	227.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	227.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	227.0	-20.3	-20.3	-20.3	-20.3	-20.3	-20.3
Shielding (Barrier Attenuation)	227.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.9	-20.3	-20.3	-20.3	-20.3	-20.3
60 Minute Hourly Adjustment		**31.9**	**-20.3**	**-20.3**	**-20.3**	**-20.3**	**-20.3**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R2**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,055.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,055.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,055.0	-30.9	-30.9	-30.9	-30.9	-30.9	-30.9
Shielding (Barrier Attenuation)	1,055.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		36.3	-30.9	-30.9	-30.9	-30.9	-30.9
60 Minute Hourly Adjustment		**36.3**	**-30.9**	**-30.9**	**-30.9**	**-30.9**	**-30.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R2**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	993.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	993.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	993.0	-46.0	-46.0	-46.0	-46.0	-46.0	-46.0
Shielding (Barrier Attenuation)	993.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.2	-46.0	-46.0	-46.0	-46.0	-46.0
39 Minute Hourly Adjustment		**29.3**	**-47.9**	**-47.9**	**-47.9**	**-47.9**	**-47.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	914.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	914.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	914.0	-29.4	-29.4	-29.4	-29.4	-29.4	-29.4
Shielding (Barrier Attenuation)	914.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		22.8	-29.4	-29.4	-29.4	-29.4	-29.4
60 Minute Hourly Adjustment		**22.8**	**-29.4**	**-29.4**	**-29.4**	**-29.4**	**-29.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R3**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	2,233.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	2,233.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	2,233.0	-37.4	-37.4	-37.4	-37.4	-37.4	-37.4
Shielding (Barrier Attenuation)	2,233.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		29.8	-37.4	-37.4	-37.4	-37.4	-37.4
60 Minute Hourly Adjustment		**29.8**	**-37.4**	**-37.4**	**-37.4**	**-37.4**	**-37.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R3**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,976.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,976.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,976.0	-51.9	-51.9	-51.9	-51.9	-51.9	-51.9
Shielding (Barrier Attenuation)	1,976.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		25.3	-51.9	-51.9	-51.9	-51.9	-51.9
39 Minute Hourly Adjustment		**23.4**	**-53.8**	**-53.8**	**-53.8**	**-53.8**	**-53.8**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,892.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	1,892.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,892.0	-34.2	-34.2	-34.2	-34.2	-34.2	-34.2
Shielding (Barrier Attenuation)	1,892.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		18.0	-34.2	-34.2	-34.2	-34.2	-34.2
60 Minute Hourly Adjustment		**18.0**	**-34.2**	**-34.2**	**-34.2**	**-34.2**	**-34.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R4**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,601.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	330.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	1,271.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,601.0	-34.5	-34.5	-34.5	-34.5	-34.5	-34.5
Shielding (Barrier Attenuation)	330.0	-10.1	-10.1	-10.1	-10.1	-10.1	-10.1
Raw (Distance + Barrier)		22.6	-44.6	-44.6	-44.6	-44.6	-44.6
60 Minute Hourly Adjustment		**22.6**	**-44.6**	**-44.6**	**-44.6**	**-44.6**	**-44.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R4**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,966.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	430.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	1,536.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,966.0	-51.9	-51.9	-51.9	-51.9	-51.9	-51.9
Shielding (Barrier Attenuation)	430.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		20.4	-56.8	-56.8	-56.8	-56.8	-56.8
39 Minute Hourly Adjustment		**18.5**	**-58.7**	**-58.7**	**-58.7**	**-58.7**	**-58.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,733.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	400.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	1,333.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,733.0	-33.6	-33.6	-33.6	-33.6	-33.6	-33.6
Shielding (Barrier Attenuation)	400.0	-10.3	-10.3	-10.3	-10.3	-10.3	-10.3
Raw (Distance + Barrier)		8.3	-43.9	-43.9	-43.9	-43.9	-43.9
60 Minute Hourly Adjustment		**8.3**	**-43.9**	**-43.9**	**-43.9**	**-43.9**	**-43.9**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R5**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,953.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	850.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	1,103.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,953.0	-36.3	-36.3	-36.3	-36.3	-36.3	-36.3
Shielding (Barrier Attenuation)	850.0	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7
Raw (Distance + Barrier)		22.2	-45.0	-45.0	-45.0	-45.0	-45.0
60 Minute Hourly Adjustment		**22.2**	**-45.0**	**-45.0**	**-45.0**	**-45.0**	**-45.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/15/2018

Observer Location: **R5**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,985.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	850.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	1,135.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,985.0	-52.0	-52.0	-52.0	-52.0	-52.0	-52.0
Shielding (Barrier Attenuation)	850.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		19.6	-57.6	-57.6	-57.6	-57.6	-57.6
39 Minute Hourly Adjustment		**17.7**	**-59.5**	**-59.5**	**-59.5**	**-59.5**	**-59.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/15/2018

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Indian & Ramona
Job Number: 11706
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,920.0	feet	***Barrier Height:***	**30.0**	**feet**
Noise Distance to Barrier:	850.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	1,070.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,920.0	-34.2	-34.2	-34.2	-34.2	-34.2	-34.2
Shielding (Barrier Attenuation)	850.0	-9.1	-9.1	-9.1	-9.1	-9.1	-9.1
Raw (Distance + Barrier)		8.9	-43.3	-43.3	-43.3	-43.3	-43.3
60 Minute Hourly Adjustment		**8.9**	**-43.3**	**-43.3**	**-43.3**	**-43.3**	**-43.3**