JS 63 MX

(F.K.A. MILESTONE MX ETHANAC ROAD MOTORCYCLE PARK)

NOISE IMPACT ANALYSIS

COUNTY OF RIVERSIDE

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949)336-5979

Sama Shami
sshami@urbanxroads.com
(949) 336-5994

AUGUST 20, 2021

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

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
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
Hz	Hertz
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
MX	Motocross
mph	Miles per hour
MSHCP	Multiple Species Habitat Conservation Plan
OPR	Office of Planning and Research
Project	JS 63 MX
REMEL	Reference Energy Mean Emission Level

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed JS 63 MX development ("Project"), formerly known as Milestone MX Ethanac Road Motorcycle Park ("Project"). The Project site is located at 21220 Ethanac Road in the County of Riverside. The Project is a Motorcycle Park/Racetrack proposed to consist of various tracks, approximately six structures, and five parking lots. The tracks would be available for practice 7 days a week and events would be limited to weekends and are estimated at approximately 15 per year. The facility would be open for evening practice 3 days per week. All Project activities will be limited to the daytime hours between 7:00 a.m. and 10:00 p.m. with no nighttime activities between the hours of 10:00 p.m. to 7:00 a.m.

This study has been prepared to satisfy applicable County of Riverside standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the 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 eight study-area roadway segments were calculated using the transportation related twenty-four-hour Community Noise Equivalent Levels (CNEL) based on average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *JS 63 MX Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) The analysis shows that the unmitigated Project-related traffic noise level increases with Project traffic scenarios are considered *less than significant* impacts at land uses adjacent to the study area roadway segments.

While the noise sensitive residential land uses located on Ethanac Road west of SR-74 will experience an off-site Project related traffic noise level increase of 5.5 dBA CNEL, the exterior noise levels of 57.0 dBA CNEL at the boundary of the right-of-way will remain well below the County of Riverside exterior transportation related noise level standards of 65 dBA CNEL.

OPERATIONAL NOISE ANALYSIS

Based on a review of the existing Milestone MX facility in the Riverside area on 12685 Holly Street, the primary operational noise sources are expected to consist of various motocross and off-road all-terrain vehicle activity. Using reference noise levels collected from the existing Milestone MX to represent the expected noise sources from the JS 63 MX site, the operational noise analysis estimates the Project-related stationary-source hourly average L_{eq} noise levels at nearby sensitive receiver locations. To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against the exterior noise limits outlined in Policy N 4.1 of the Noise Element.

The operational noise analysis shows the expected Project operational noise are expected to range from 48.0 to 54.7 dBA L_{eq} during the daytime hours of 7:00 a.m. to 10:00 p.m. at the nearest noise sensitive residential receivers located at distances ranging from 530 to 2,104 feet from the Project site boundary. The operational noise analysis demonstrates that the operational noise levels associated with JS 63 MX Project will satisfy the County of Riverside 65 dBA L_{eq} daytime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations provided that all Project activities will be limited to the daytime hours between 7:00 a.m. and 10:00 p.m.

Since the existing ambient noise levels already exceed the general exterior sound level standards of 45 dBA L_{eq}, the Project would request an exception from certain requirements of Ordinance No. 847 in accordance with Section 7, Exceptions, which specifically allows for the application for continuous exceptions from the provisions of Ordinance No. 847. The exception is subject to a fee and the County Planning Director's approval.

In addition, the operational noise analysis shows that the Project-related motocross noise levels will satisfy the 65 dBA L_{eq} exterior noise level threshold identified for the proposed MSHCP Conservation Areas. Accordingly, the Project's noise impacts to the adjacent MSHCP Conservation Area would be *less than significant.*

CONSTRUCTION NOISE ANALYSIS

On-site construction noise represents a short-term increase on the ambient noise levels associated with the development of the Project on nearby receivers. 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, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the County of Riverside General Plan and Municipal Codes do not identify specific construction noise level limits, this analysis relies on the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use.

This analysis shows that the Project-related short-term construction noise levels are estimated to range from 50.1 to 69.5 dBA $L_{eq.}$ The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

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. At distances ranging from 530 to 2,104 feet from Project construction

activities, construction vibration velocity levels are estimated to range from 0.000 to 0.001 in/sec RMS and will remain below the County of Riverside threshold of 0.01 in/sec RMS at all receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this JS 63 MX Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures described below.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

This page intentionally left blank

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed JS 63 MX ("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 transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes a detailed analysis of the potential Project-related motorcycle operational noise impacts.

1.1 SITE LOCATION

The proposed JS 63 MX site is located at 21220 Ethanac Road in the County of Riverside, as shown in Exhibit 1-A. Existing land uses near the site include nearby noise sensitive residential homes located to the north and the east of the site. Access to the Project site will be provided to the SR-74 Highway via Ethanac Road.

1.2 PROJECT DESCRIPTION

The Project is a Motorcycle Park/Racetrack proposed to consist of various tracks, approximately six structures, and five parking lots as shown on Exhibit 1-B. The six proposed structures would consist of the following uses: proposed storage units with a bathroom (with 4-6 stalls) and snack bar; proposed bike wash; proposed Pro Shop building; proposed Pro Race Shops building; proposed ticket booth; and a proposed event hall building with a bathroom and shower area. There would be four parking areas for automobiles and a designated R.V. (Recreational Vehicle) parking area. The tracks would be available for practice 7 days a week and events would be limited to weekends and are estimated at approximately 15 per year. The facility would be open for evening practice 3 days per week. All Project activities will be limited to the daytime hours between 7:00 a.m. and 10:00 p.m. with no nighttime activities between the hours of 10:00 p.m. to 7:00 a.m.

Per the *JS 63 MX Traffic Impact Analysis* (TIA) prepared by Urban Crossroads, Inc. the Project is expected to generate a total of approximately 410 two-way vehicular trips per day (2).

EXHIBIT 1-A: LOCATION MAP

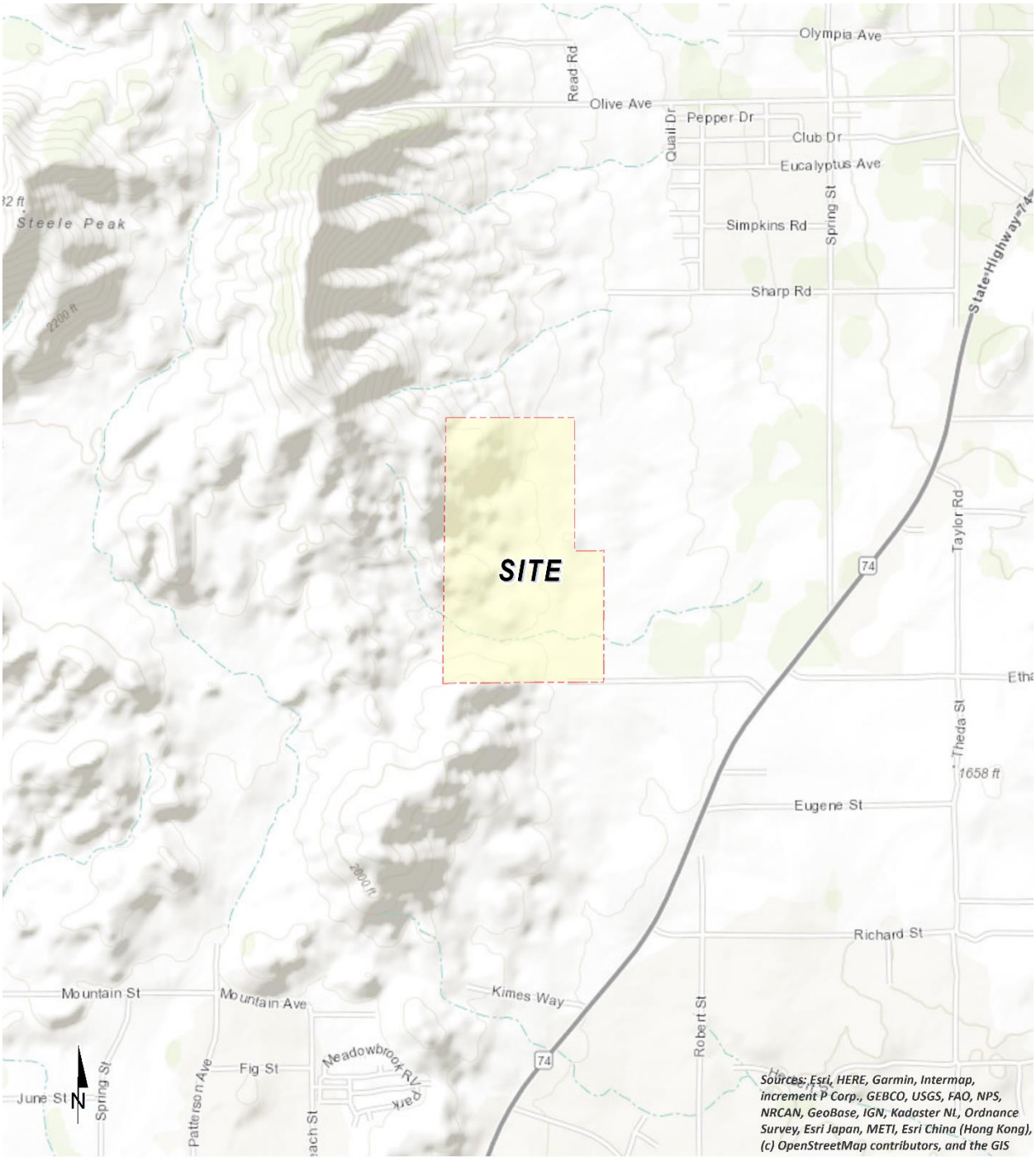
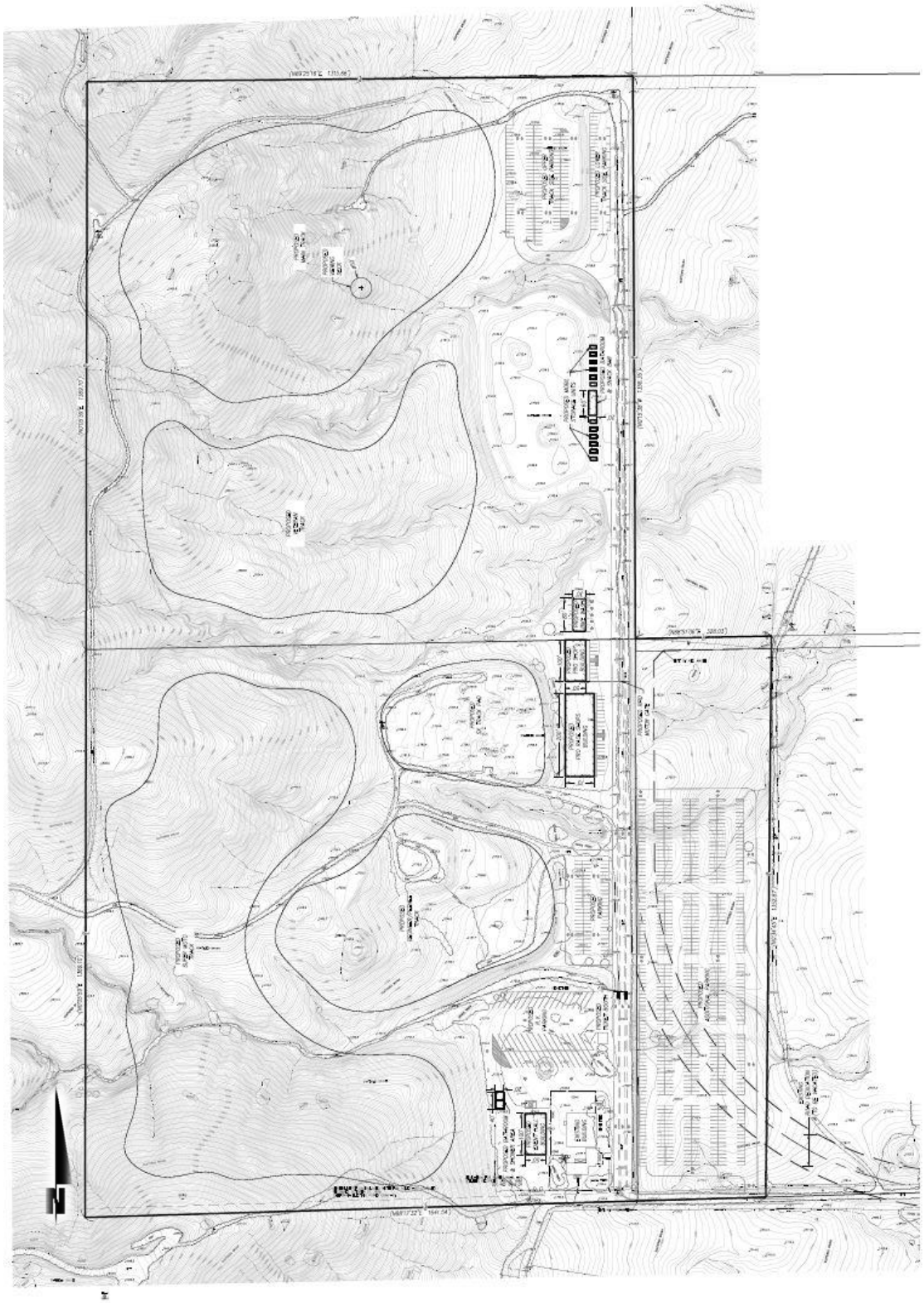


EXHIBIT 1-B: SITE PLAN



This page intentionally left blank

2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (3) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (4) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). 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 (typically one hour) and is commonly used to describe the "average" noise levels within the environment. The Project hourly average L_{eq} noise descriptor is used in this analysis to describe the stationary-source operational and construction noise levels.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of Riverside relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (3)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a

reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (5)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (3)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (5)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (5)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial

developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

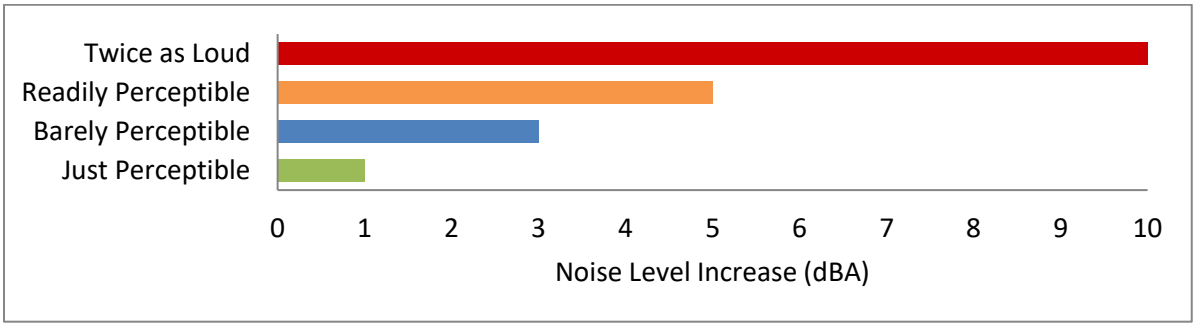
2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (7) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (7) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (5)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



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 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 (including motorcycles), while regulation of stationary (operational) noise 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 per guidelines adopted by the Governor's Office of Planning and Research (OPR). (8) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

The County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of County of Riverside from excessive exposure to noise. (9) The Noise Element specifies the maximum allowable 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 several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect County of Riverside residents from excessive noise, the Noise Element contains the following policies related to the Project:

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

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- *Schools*
- *Hospitals*
- *Rest Homes*
- *Long Term Care Facilities*
- *Mental Care Facilities*

- *Residential Uses*
- *Libraries*
- *Passive Recreation Uses*
- *Places of Worship*

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

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

a. 45 dBA 10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.

b. 65 dBA 10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

To ensure noise-sensitive land uses are protected from high levels of noise (N 1.1), Table N-1 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element identifies residential use as a noise-sensitive land use (N 1.3) and discourages new development in areas with transportation related levels of 65 dBA CNEL or greater existing ambient noise levels. To prevent and mitigate noise impacts for its residents (N 1.5), County of Riverside requires noise attenuation measures for sensitive land use exposed to transportation related noise levels higher than 65 dBA CNEL. Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit to not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m.

3.3 COUNTY OF RIVERSIDE STATIONARY NOISE STANDARDS

In addition to the guidelines and policies contained in the General Plan Noise Element, the County of Riverside has adopted Noise Regulations as part of its Ordinance No. 847 regulating noise to limit noise that may jeopardize the health, safety or general welfare of residents and degrade their quality of life. Ordinance No. 847 establishes the general sound level standards regulating noise that may intrude into a neighboring property. The Ordinance is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (CEQA).

According to Section 4 Table 1, exterior noise levels for the noise sensitive rural residential land uses shall not exceed 45 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (10) The County of Riverside Noise Ordinance Regulations are included in Appendix 3.1. However, a review of the existing ambient noise level measurements presented in Section 5 shows that the existing daytime ambient noise levels already exceed the general exterior sound level standards of 45 dBA L_{eq}. Therefore, the Project would request an exception from certain requirements of Ordinance No. 847 in accordance with Section 7, Exceptions, which specifically allows for the application for continuous exceptions from the provisions of Ordinance No. 847. The exceptions are subject to a fee and the County Planning Director's approval. Since the existing ambient noise levels in the Project study area already exceed the 45 dBA L_{eq} general exterior sound level standards for rural

residential land use, this analysis relies on stationary-source daytime exterior noise limit of 65 dBA L_{eq} outlined in Policy N 4.1 of the Noise Element

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the County of Riverside has established limits to the hours of operation. Section 2.i. of the County's Noise Ordinance No. 847 indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. Neither the County's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (11 p. 179)

3.5 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. (11) 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. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity.

The County of Riverside does not have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.0787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. Further, County of Riverside General Plan Policy N 16.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz, which is used in this noise study to assess potential impacts due to Project construction vibration levels. (9)

This page intentionally left blank

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

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

While the County of Riverside 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, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within an airport land use plan or within 2 miles of a public airport, or within the vicinity of a private airstrip. Therefore, the Project would not result in potential noise impacts for people residing or working at the Project site. As such, the Project does not have the potential to expose people residing or working in the Project area to excessive noise levels and no impact would occur. No further analysis of CEQA Guideline C is required.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must 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.* (12)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (13) developed guidance to be used for the assessment

of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (12) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the existing noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (9)

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria were used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.3 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 existing and future noise-sensitive land uses (e.g. residential, etc.):
  - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
  - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
  - already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g., office, commercial, industrial):
  - are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
  - are greater than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels exceed the exterior 65 dBA L_{eq} daytime or 45 dBA L_{eq} nighttime noise level standards at nearby sensitive receiver locations (Policy N 4.1 of the Noise Element)
- 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 *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
  - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
  - already exceed 65 dBA L_{eq} and the Project creates a community noise level increase of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE & VIBRATION

- If Project-related construction activities create noise levels which exceed the 80 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual);

- If short-term Project-generated construction vibration levels exceed the County of Riverside vibration standard of 0.01 in/sec RMS at sensitive receiver locations (County of Riverside General Plan Noise Element, Policy N 16.3).

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	Noise-Sensitive[1]	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[1,2]	If ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
		If ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
Operational	Noise-Sensitive	Exterior Noise Level Standards[3]	65 dBA L_{eq}	45 dBA L_{eq}
		If ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
		If ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA CNEL Project increase and the resulting noise level would exceed acceptable exterior noise standards	
Construction	Noise-Sensitive	Noise Level Threshold[4]	80 dBA L_{eq}	
		Vibration Level Threshold[5]	0.01 in/sec RMS	

[1] Source: FICON, 1992.
[2] Source: County of Riverside General Plan Noise Element, Table N-1.
[3] Source: County of Riverside General Plan Noise Element, Policy 4.1
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[5] County of Riverside General Plan Noise Element, Policy N 16.3.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four 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 Tuesday, July 30th, 2019. 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. (14)

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*. (3) 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*. (11)

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. (11) 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 (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels north of the Project site on Sharp Road near existing residential home and vacant land. The noise levels at this location consist primarily of traffic noise from Sharp Road. The noise level measurements collected show an overall 24-hour exterior noise level of 54.2 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 53.5 dBA L_{eq} with an average nighttime noise level of 44.8 dBA L_{eq}.
- Location L2 represents the noise levels east of the Project site. The ambient noise levels at this location account for traffic on Spring Street. The noise level measurements collected show an overall 24-hour exterior noise level of 54.5 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 49.0 dBA L_{eq} with an average nighttime noise level of 47.8 dBA L_{eq}.
- Location L3 represents the noise levels south of the project on Read Street and Ethanac Road near existing residential home. The noise level measurements collected show an overall 24-hour exterior noise level of 55.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 50.0 dBA L_{eq} with an average nighttime noise level of 49.0 dBA L_{eq}. The noise levels at this location consist primarily of traffic noise from Ethanac Road.
- Location L4 represents the noise levels on the southern boundary of the Project site near existing vacant land. The 24-hour CNEL indicates that the overall exterior noise level is 50.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 46.7 dBA L_{eq} with an average nighttime noise level of 43.3 dBA L_{eq}. Traffic on Ethanac Road represents the primary source of noise at this location.

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 surface streets. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located north of the Project site on Sharp Road near existing residential home and vacant land.	53.5	44.8	54.2
L2	Located east of the Project site.	49.0	47.8	54.5
L3	Located south of the project on Read Street and Ethanac Road near existing residential home.	50.0	49.0	55.8
L4	Located on the southern boundary of the Project site near existing vacant land.	46.7	43.3	50.8

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 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. Consistent with the County of Riverside General Plan *Land Use Compatibility for Community Noise Exposure* matrix, all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (15) 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. (16) 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.

This is methodology is consistent with the County of Riverside Office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*, which specifically requires the FHWA RD-77-108 model to be used in analysis within the County's jurisdiction. (17)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site dBA CNEL transportation noise impacts. Table 6-1 identifies the 8 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of Riverside General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-2 are based on the *JS 63 MX Traffic Impact Analysis* prepared by Urban Crossroads, Inc. for the following traffic scenarios:

1. Existing (E) Conditions
2. Existing plus Project (E+P) Conditions
3. Existing plus Ambient (EA) Conditions
4. Existing plus Ambient with Project (EAP) Conditions
5. Existing plus Ambient plus Cumulative without Project (EAC) Conditions
6. Existing plus Ambient plus Cumulative with Project (EAPC) Conditions

The ADT volumes vary for each roadway segment based on the existing and future year traffic volumes plus the project traffic volumes for each traffic scenario. The *General Plan Noise Element* (9) requires that future on-site traffic noise impacts be assessed using the maximum capacity design standard for highways and major roads. However, this analysis relies on a comparative analysis of the off-site traffic noise impacts, without and with project ADT traffic volumes from the Project traffic study. The use of the maximum capacity design standards is typically reserved for determining the future long-range on-site traffic noise impacts, not the comparative contributions associated with the off-site Project traffic noise level impacts.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Distance from Centerline to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)
1	SR-74	n/o Theda St.	VLDR	64'	60
2	SR-74	s/o Theda St.	VLDR/RR	64'	60
3	SR-74	n/o Ethanac Rd.	RR/LI	59'	60
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	110'	60
5	SR-74	n/o River Rd.	VLDR/MU/CR	110'	60
6	SR-74	s/o River Rd.	VLDR/MU/CR	110'	60
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	110'	60
8	Ethanac Rd.	w/o SR-74	VLDR/RR	37'	40

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] Distance to receiving land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Element.
"RR" = Rural Residential; "LDR" = Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use; "VLDR"= Very Low Density Residential.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		Existing + Ambient (EA)		Existing + Ambient + Cumulative (EAC)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	SR-74	n/o Theda St.	26,059	26,248	26,841	27,030	28,241	28,430
2	SR-74	s/o Theda St.	29,216	29,426	30,093	30,303	31,643	31,853
3	SR-74	n/o Ethanac Rd.	27,965	28,175	28,804	29,014	30,352	30,562
4	SR-74	s/o Ethanac Rd.	28,879	29,089	29,745	29,955	31,293	31,503
5	SR-74	n/o River Rd.	29,949	30,159	30,847	31,057	31,937	32,147
6	SR-74	s/o River Rd.	29,404	29,614	30,286	30,496	31,226	31,436

[1] Source: Milestone JS 63 Traffic Impact Analysis, Urban Crossroads, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Riverside County (Expressway, Arterial, Major)				
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%
Riverside County (Secondary, Collector)				
Autos	75.55%	13.96%	10.49%	100.00%
Medium Trucks	48.91%	2.17%	48.91%	100.00%
Heavy Trucks	47.30%	5.41%	47.30%	100.00%

[1] Source: County of Riverside Office of Industrial Hygiene, 2017.
"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.

TABLE 6-4: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
Expressway, Arterial, Major[1]	92.00%	3.00%	5.00%	100.00%
Secondary, Collector[1]	97.42%	1.84%	0.74%	100.00%

[1] Source: County of Riverside Office of Industrial Hygiene, 2017.

7 OFF-SITE TRANSPORTATION NOISE ANALYSIS

To assess the off-site transportation dBA CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *JS 63 MX Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in dBA 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 and Ambient Conditions Without / With Project:
  - This scenario refers to the background noise conditions at future without and with the proposed Project plus ambient growth.
- Existing and Ambient and Cumulative Without / With Project:
  - This scenario refers to the existing and cumulative noise conditions without and with the proposed Project.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. 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 CNEL noise levels. The noise contours do not consider 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 dBA CNEL traffic noise levels, without barrier attenuation, for the eight study area roadway segments analyzed from without Project to with Project conditions in each of the following timeframes: Existing, Existing plus Ambient, and Existing plus Ambient plus Cumulative. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.5	236	509	1096
2	SR-74	s/o Theda St.	VLDR/RR	79.0	255	549	1183
3	SR-74	n/o Ethanac Rd.	RR/LI	79.4	251	541	1165
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.1	280	603	1299
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.2	287	618	1331
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.2	283	610	1315
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.7	306	660	1422
8	Ethanac Rd.	w/o SR-74	VLDR/RR	51.4	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-2: EXISTING WITH PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.5	237	511	1101
2	SR-74	s/o Theda St.	VLDR/RR	79.0	256	552	1188
3	SR-74	n/o Ethanac Rd.	RR/LI	79.5	252	544	1171
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.1	281	606	1306
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.3	288	621	1337
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.2	285	613	1321
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.7	308	663	1427
8	Ethanac Rd.	w/o SR-74	VLDR/RR	57.0	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-3: EXISTING PLUS AMBIENT WITHOUT PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.6	241	519	1118
2	SR-74	s/o Theda St.	VLDR/RR	79.1	260	560	1206
3	SR-74	n/o Ethanac Rd.	RR/LI	79.6	256	552	1188
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.2	286	615	1325
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.4	293	630	1358
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.3	289	623	1341
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.8	312	673	1450
8	Ethanac Rd.	w/o SR-74	VLDR/RR	51.5	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-4: EXISTING PLUS AMBIENT WITH PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.7	242	521	1123
2	SR-74	s/o Theda St.	VLDR/RR	79.2	261	563	1212
3	SR-74	n/o Ethanac Rd.	RR/LI	79.6	257	554	1194
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.2	287	618	1331
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.4	294	633	1364
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.3	290	625	1347
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.8	314	676	1456
8	Ethanac Rd.	w/o SR-74	VLDR/RR	57.0	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-5: EXISTING PLUS AMBIENT PLUS CUMULATIVE WITHOUT PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.9	249	537	1156
2	SR-74	s/o Theda St.	VLDR/RR	79.3	269	579	1247
3	SR-74	n/o Ethanac Rd.	RR/LI	79.8	265	571	1231
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.4	295	636	1371
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.5	299	645	1390
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.4	295	635	1369
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.9	316	682	1468
8	Ethanac Rd.	w/o SR-74	VLDR/RR	51.5	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-6: EXISTING PLUS AMBIENT PLUS CUMULATIVE WITH PROJECT

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	SR-74	n/o Theda St.	VLDR	78.9	250	539	1161
2	SR-74	s/o Theda St.	VLDR/RR	79.4	270	582	1253
3	SR-74	n/o Ethanac Rd.	RR/LI	79.8	266	574	1236
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	76.5	297	639	1377
5	SR-74	n/o River Rd.	VLDR/MU/CR	76.6	301	648	1396
6	SR-74	s/o River Rd.	VLDR/MU/CR	76.5	296	638	1375
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	76.9	318	684	1474
8	Ethanac Rd.	w/o SR-74	VLDR/RR	57.0	RW	RW	RW

[1] Sources: Mead Valley Area Plan, Land Use Plan, Figure 3.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

7.2 EXISTING CONDITIONS NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the *JS 63 MX Traffic Impact Analysis* prepared by Urban Crossroads, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until future year cumulative conditions. Therefore, no mitigation measures are considered to reduce the Existing Plus Project traffic noise level increases. The Existing plus Ambient Plus Cumulative traffic noise conditions that include all cumulative projects are used to determine the significance of the Project off-site traffic noise level increases on the study area roadway segments.

Table 7-1 shows the Existing without Project conditions dBA CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 51.4 to 79.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions dBA CNEL noise levels will range from 57.0 to 79.5 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level increases will range from 0.0 to 5.6 dBA CNEL on the study area roadway segments.

7.3 EXISTING CONDITIONS PLUS AMBIENT NOISE LEVEL INCREASES

Table 7-3 presents the Existing Conditions plus Ambient without proposed Project conditions dBA CNEL noise levels ranging from 51.5 to 79.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows existing plus ambient with proposed project conditions ranging from 57.0 to 79.6 dBA CNEL. Table 7-8 shows that the Project off-site traffic noise level increases will range from 0.0 to 5.5 dBA CNEL on the study area roadway segments.

7.4 EXISTING CONDITIONS PLUS AMBIENT PLUS CUMULATIVE NOISE LEVEL INCREASES

Table 7-5 shows the Existing plus Ambient Plus Cumulative without Project conditions dBA CNEL noise levels ranging from 51.5 to 79.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Existing plus Ambient plus Cumulative with Project conditions dBA CNEL noise levels ranging from 57.0 to 79.8 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from 0.0 to 5.5 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

While the noise sensitive residential land uses located on Ethanac Road west of SR-74 will experience an off-site Project related traffic noise level increase of 5.5 dBA CNEL, the exterior noise levels of 57.0 dBA CNEL at the boundary of the right-of-way will remain well below the County of Riverside exterior transportation related noise level standards of 65 dBA CNEL.

TABLE 7-7: EXISTING PLUS PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]		Exterior Noise Level (dBA CNEL)[3]	
					No Project	With Project	Project Increase	Criteria	Exceeded?	Standard	Exceeded?
1	SR-74	n/o Theda St.	VLDR	Yes	78.5	78.5	0.0	1.5	No	65	Yes
2	SR-74	s/o Theda St.	VLDR/RR	Yes	79.0	79.0	0.0	1.5	No	65	Yes
3	SR-74	n/o Ethanac Rd.	RR/LI	Yes	79.4	79.5	0.1	1.5	No	65	Yes
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	Yes	76.1	76.1	0.0	1.5	No	65	Yes
5	SR-74	n/o River Rd.	VLDR/MU/CR	Yes	76.2	76.3	0.1	1.5	No	65	Yes
6	SR-74	s/o River Rd.	VLDR/MU/CR	Yes	76.2	76.2	0.0	1.5	No	65	Yes
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	Yes	76.7	76.7	0.0	1.5	No	65	Yes
8	Ethanac Rd.	w/o SR-74	VLDR/RR	Yes	51.4	57.0	5.6	5.0	Yes	65	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

[3] Does the Project exceed the transportation related exterior noise level standards for the receiving land use?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-8: EXISTING PLUS AMBIENT CONDITIONS TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]		Exterior Noise Level (dBA CNEL)[3]	
					No Project	With Project	Project Increase	Criteria	Exceeded?	Standard	Exceeded?
1	SR-74	n/o Theda St.	VLDR	Yes	78.6	78.7	0.1	1.5	No	65	Yes
2	SR-74	s/o Theda St.	VLDR/RR	Yes	79.1	79.2	0.1	1.5	No	65	Yes
3	SR-74	n/o Ethanac Rd.	RR/LI	Yes	79.6	79.6	0.0	1.5	No	65	Yes
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	Yes	76.2	76.2	0.0	1.5	No	65	Yes
5	SR-74	n/o River Rd.	VLDR/MU/CR	Yes	76.4	76.4	0.0	1.5	No	65	Yes
6	SR-74	s/o River Rd.	VLDR/MU/CR	Yes	76.3	76.3	0.0	1.5	No	65	Yes
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	Yes	76.8	76.8	0.0	1.5	No	65	Yes
8	Ethanac Rd.	w/o SR-74	VLDR/RR	Yes	51.5	57.0	5.5	5.0	Yes	65	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?

[3] Does the Project exceed the transportation related exterior noise level standards for the receiving land use?

"RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

TABLE 7-9: EXISTING PLUS AMBIENT PLUS CUMULATIVE TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	Noise-Sensitive Land Use?	CNEL at Receiving Land Use (dBA)[1]			Noise Level Increase Significance Criteria[2]		Exterior Noise Level (dBA CNEL)[3]		Significant Impact?
					No Project	With Project	Project Increase	Criteria	Exceeded?	Standard	Exceeded?	
1	SR-74	n/o Theda St.	VLDR	Yes	78.9	78.9	0.0	1.5	No	65	Yes	No
2	SR-74	s/o Theda St.	VLDR/RR	Yes	79.3	79.4	0.1	1.5	No	65	Yes	No
3	SR-74	n/o Ethanac Rd.	RR/LI	Yes	79.8	79.8	0.0	1.5	No	65	Yes	No
4	SR-74	s/o Ethanac Rd.	VLDR/MU/CR	Yes	76.4	76.5	0.1	1.5	No	65	Yes	No
5	SR-74	n/o River Rd.	VLDR/MU/CR	Yes	76.5	76.6	0.1	1.5	No	65	Yes	No
6	SR-74	s/o River Rd.	VLDR/MU/CR	Yes	76.4	76.5	0.1	1.5	No	65	Yes	No
7	SR-74	s/o Meadowbrook Av.	MU/VLDR	Yes	76.9	76.9	0.0	1.5	No	65	Yes	No
8	Ethanac Rd.	w/o SR-74	VLDR/RR	Yes	51.5	57.0	5.5	5.0	Yes	65	No	No

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[2] Does the Project create an off-site transportation related noise level increase exceeding the significance criteria (Table 4-1)?
[3] Does the Project exceed the transportation related exterior noise level standards for the receiving land use?
"RW" = Location of the respective noise contour falls within the right-of-way of the road. "RR" = Rural Residential; "VLDR" = Very Low Density Residential; "CR" = Commercial Retail; "LI" = Light Industrial; "MU" = Mixed Use.

8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Receiver locations are located in outdoor living areas (e.g., backyards) at 10 feet from any existing or proposed barriers or at the building façade, whichever is closer to the Project site, based on FHWA guidance, and consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Sensitive receiver locations in the Project study area include residential uses 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. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Located approximately 530 feet north of the Project site, R1 represents existing single family-residential home. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing residential home located northeast of the Project site at roughly 1,225 feet, on the west side of Spring Street just south of Sharp Road. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

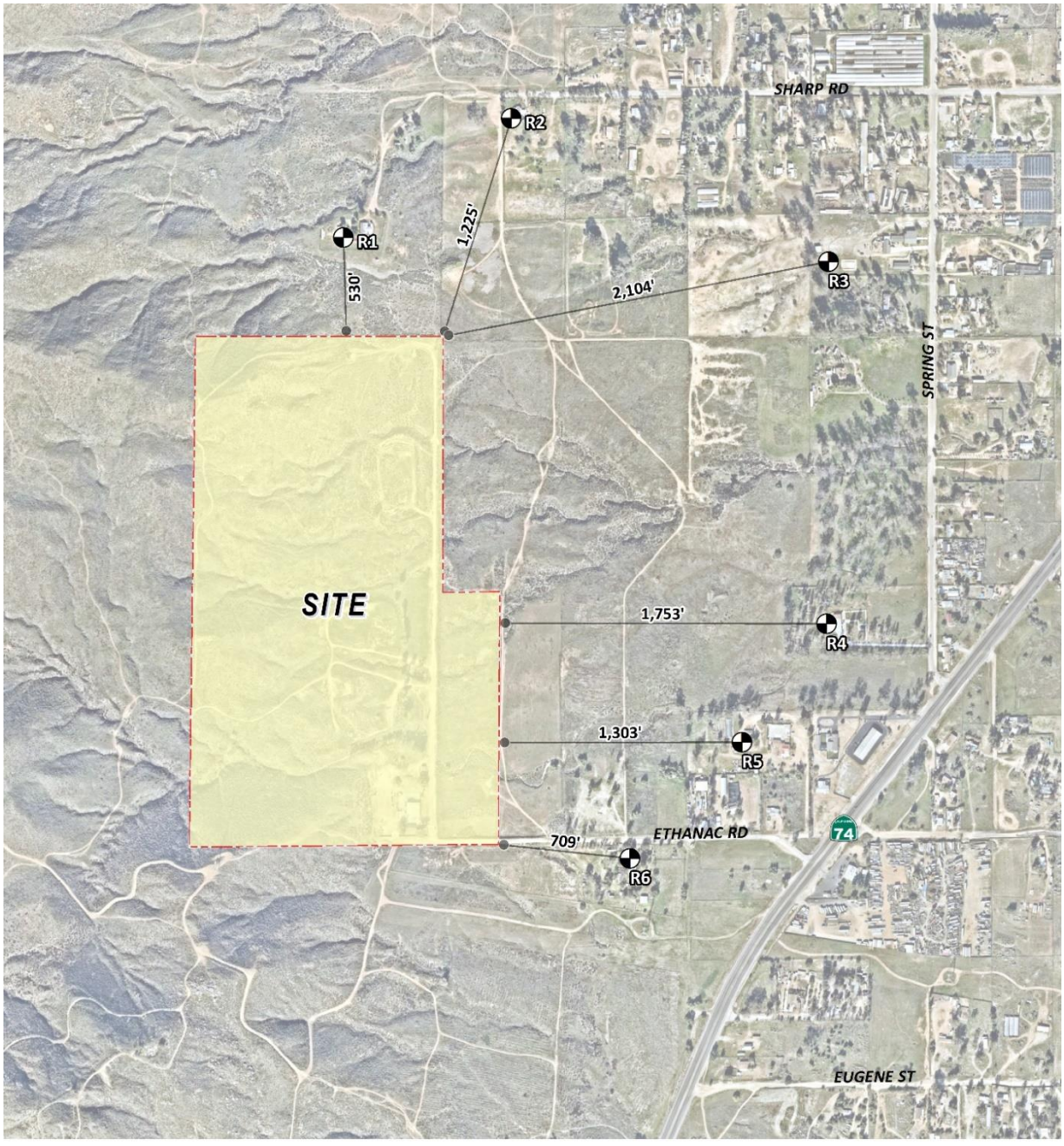
R3: Location R3 represents a noise sensitive use west of Spring St approximately 2,104 feet from the Project site, at 25401 Spring Street. A 24-hour noise measurement near this location, L2, is used to describe the existing ambient noise environment.

R4: Location R4 represents the existing residential homes on the northeast side of Ethanac Road approximately 1,753 feet from the Project site. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R5: Location R5 represents the existing residential home on the north side of Ethanac Road at approximately 1,303 feet from the Project site. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R6: Location R6 represents the existing residential home on the south side of Ethanac Road at approximately 709 feet from the Project site. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS



9 OPERATIONAL NOISE ANLAYSIS

This section analyzes the potential stationary-source hourly average L_{eq} noise level impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed JS 63 MX 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

Based on a review of the existing Milestone MX facility in the Riverside area on 12685 Holly Street, the primary operational noise sources are expected to consist of various motocross and off-road all-terrain vehicle activity. This noise analysis is intended to describe the hourly L_{eq} noise level impacts associated with the typical weekday operational activities at the Project site.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with all the motocross tracks operating continuously throughout the Project site. These sources of noise activity will likely vary by location throughout the day. Appendix 9.1 provides reference measurement photos for each noise source.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using Piccolo Type 2 integrating sound level meters and dataloggers. All sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. 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. (14)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

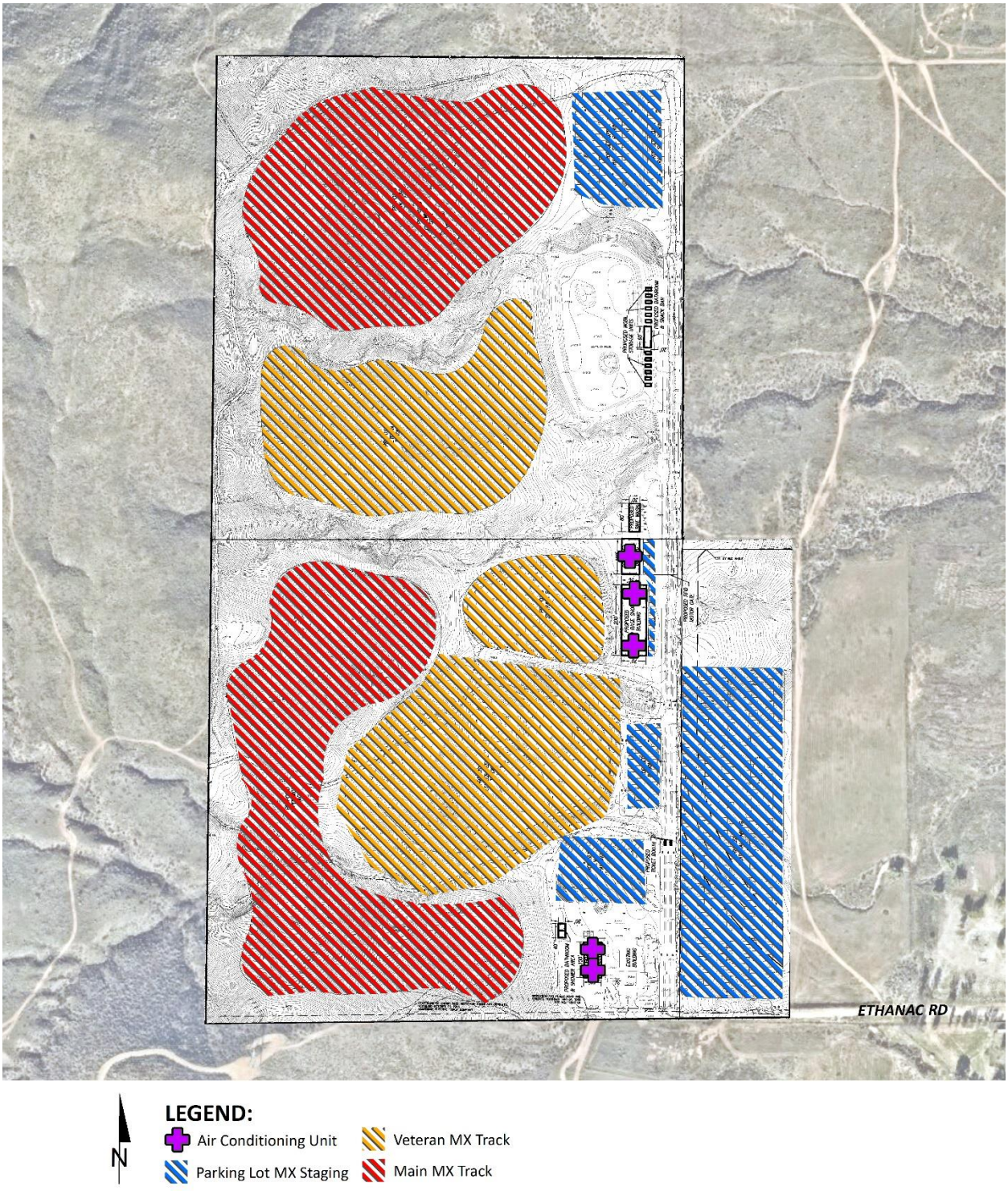


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)[3]	Noise Source Height (Feet)	Reference Noise Level (dBA L_{eq})		Sound Power Level (dBA)[4]
				@ Ref. Dist.	@ 50 Feet	
Main MX Track[1]	01:14:00	50'	5'	70.5	70.5	117.8
Veteran MX Track[1]	01:13:00	15'	5'	76.7	66.2	113.5
Parking Lot MX Staging[1]	01:06:00	15'	5'	70.5	60.0	105.1
Air Conditioning Units[2]	96:00:00	5'	15'	77.2	57.2	88.9

[1] As measured by Urban Crossroads, Inc. at the existing Milestone MX park located at 12685 Holly Street, Riverside.
[2] As measured by Urban Crossroads, Inc. at the Santee Walmart located at 170 Town Center Parkway.
[3] Distance from adjacent noise source to noise level measurement location.
[4] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

9.2.1 MAIN MX TRACK

According to Milestone MX, the main mx track is targeted towards intermediate and professional riders. To describe the noise levels associated with the main mx motocross activities, short-term reference noise level measurements were collected during peak weekday activity on Friday, August 16th, 2019, by Urban Crossroads, Inc. at the existing Milestone MX site. The short-term reference noise levels were collected in the late afternoon (between the hours of 3:00 p.m. to 5:00 p.m.) at the main mx track located at 12685 Holly Street in the City of Riverside.

At 50 feet from the center of motocross noise source activity, the main mx track generated a reference noise level of 70.5 dBA L_{eq}. The main mx track noise level measurement was collected over a period of one hour and fourteen minutes of continuous intermediate and professional rider motocross activity. In addition, due to the proximity of the main mx track to the veteran mx, the main mx track reference noise level measurement may include some additional background noise activity from veteran mx track.

9.2.2 VETERAN MX TRACK

The veteran mx track is targeted towards beginner riders. To describe the noise levels associated with typical veteran mx track activities, short-term reference noise level measurements were collected during peak weekday activity on Friday, August 16th, 2019, by Urban Crossroads, Inc. at the existing Milestone MX site. The short-term reference noise levels were collected in the late afternoon (between the hours of 3:00 p.m. to 5:00 p.m.) near the veteran mx track located at 12685 Holly Street in the City of Riverside. At 50 feet the center of the motocross noise source activity, the veteran mx track generated a reference noise level of 66.2 dBA Leq. The veteran track noise level measurement was collected over a period of one hour and thirteen minutes of continuous motocross activity.

9.2.3 PARKING LOT

To determine the noise levels associated with parking lot vehicle movements and motocross staging activities, Urban Crossroads collected reference noise level measurements for a period of one hour and six minutes on Friday, August 16th, 2019 in the parking lot of the existing Milestone MX site. The reference noise level at 50 feet from parking lot vehicle movements was measured at 60.0 dBA L_{eq}. The parking lot noise levels are mainly due to vehicles, vans and trucks maneuvering in the parking lot, motocross bike preparation and staging before and after riding on the Milestone MX tracks.

9.2.4 AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units within the planned commercial retail land uses within the Project site, reference noise levels measurements were taken at the Santee Walmart. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of the existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA L_{eq}. At the uniform reference distance of 50 feet, the reference noise levels are 57.2 dBA L_{eq}. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings. The noise attenuation provided by the existing parapet wall is not reflected in this reference noise level measurement.

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze the noise level of multiple types of noise sources and calculates the noise levels at any location using the spatially accurate Project site plan and includes the effects of topography, buildings, and multiple barriers in its calculations using the latest standards to predict outdoor noise impacts. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section. Using the spatially accurate Project site plan and flown aerial imagery from Nearmap, a CadnaA noise prediction model of the Project study area was developed. The noise model provides a three-dimensional representation of the Project study area using the following key data inputs:

- Ground absorption;
- Multiple reflections at buildings and barriers;
- Reference noise level sources by type (area, point, etc.) and noise source height;
- Multiple noise receiver locations and heights;
- Topography and earthen berms;

- Barrier and building heights.

Using the ISO 9613 protocol, the CadnaA noise prediction model will calculate the distance from each noise source to the noise receiver locations, the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level calculations at each receiver location and the partial noise level contributions by noise source. The reference sound power level (PWL) for the highest noise source expected at the Project site was input into the CadnaA noise prediction model.

While sound pressure levels (e.g. L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish as a result of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. The operational noise level calculations provided in this noise study 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. Appendix 9.2 includes the detailed calculations for the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include continuous motocross activity, 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 at the nearest noise sensitive residential receivers located at distances ranging from 530 to 2,104 feet from the Project site boundary. Table 9-2 shows the expected Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 48.0 to 54.7 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1,2]	Operational Noise Levels by Receiver Location (dBA Leq)					
	R1	R2	R3	R4	R5	R6
Main MX Track	53.6	48.4	46.0	47.2	49.2	49.9
Veteran MX Track	46.2	44.0	42.7	45.1	47.8	49.5
Parking Lot MX Staging	43.7	38.1	36.5	40.2	42.3	44.1
Air Conditioning Units	27.2	22.6	22.9	27.0	29.6	31.5
Total (All Noise Sources)	**54.7**	**50.0**	**48.0**	**49.8**	**52.1**	**53.3**

[1] See Exhibit 9-A for the noise source locations.
[2] CadnaA noise model calculations are included in Appendix 9.2.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against the 65 dBA L_{eq} stationary-source daytime exterior noise limit outlined in Policy N 4.1 of the Noise Element. Table 9-3 shows that the operational noise levels associated with JS 63 MX Project will satisfy the County of Riverside 65 dBA L_{eq} daytime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations provided that all Project activities will be limited to the daytime hours between 7:00 a.m. and 10:00 p.m.

TABLE 9-3: PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]	Noise Level Standards (dBA Leq)[3]	Standards Exceeded?[4]
R1	54.7	65	No
R2	50.0	65	No
R3	48.0	65	No
R4	49.8	65	No
R5	52.1	65	No
R6	53.3	65	No

[1] See Exhibit 8-A for the noise receiver locations.
[2] Proposed Project operational noise levels as shown on Table 9-2.
[3] County of Riverside exterior noise level standards for residential land use, as shown on Table 4-1.
[4] Do the estimated Project operational noise source activities exceed the daytime noise level standards?

9.6 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

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. (3) 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 describes 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 daytime ambient conditions are presented on Table 9-4. As indicated on Table 9-4, the Project will generate an unmitigated daytime operational noise level increases ranging from 1.6 to 5.0 dBA L_{eq} at the nearby receiver locations. Project-related operational noise level contributions will satisfy the operational noise level increase significance

criteria presented on Table 4-1, and, therefore, the noise level increases at the sensitive receiver locations will be *less than significant.*

TABLE 9-4: DAYTIME PROJECT OPERATIONAL 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]	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	54.7	L1	53.5	57.1	3.6	5.0	No
R2	50.0	L1	53.5	55.1	1.6	5.0	No
R3	48.0	L2	49.0	51.5	2.5	5.0	No
R4	49.8	L3	50.0	52.9	2.9	5.0	No
R5	52.1	L3	50.0	54.2	4.2	5.0	No
R6	53.3	L3	50.0	55.0	5.0	5.0	No

[1] See Exhibit 9-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 10-6.
[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.

9.7 MSHCP NOISE LEVELS

The Multiple Species Habitat Conservation Plan (MSHCP) adopted by the Western Riverside County Regional Conservation Authority (18) requires *that noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations, and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.* Since the proposed JS 63 MX development will include noise generating motocross activities, operation noise levels have been calculated at the Project boundaries in order to estimate the Project related noise levels within the adjacent MSHCP conservation areas.

To minimize the effects of noise on the nearby MSHCP Conservation Areas, this analysis relies on the 65 dBA L_{eq} exterior noise level limit identified by Policy N 4.1 of the General Plan. As shown on Exhibit 9-B, five MSHCP receiver locations are used to calculate the Project operational noise levels at the Project site boundaries. The five MSHCP receivers were placed at the Project site boundaries to estimate the highest Project motocross noise levels within the nearby MSHCP conservation areas. This approach reflects the setback buffers shown on the Project site plan that places the MX Tracks at distances ranging from 50 to 150 feet. Appendix 9.3 includes the detailed CadnaA noise prediction model MSHCP calculations for the Project operational noise levels presented in this section.

EXHIBIT 9-B: MSHCP OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS

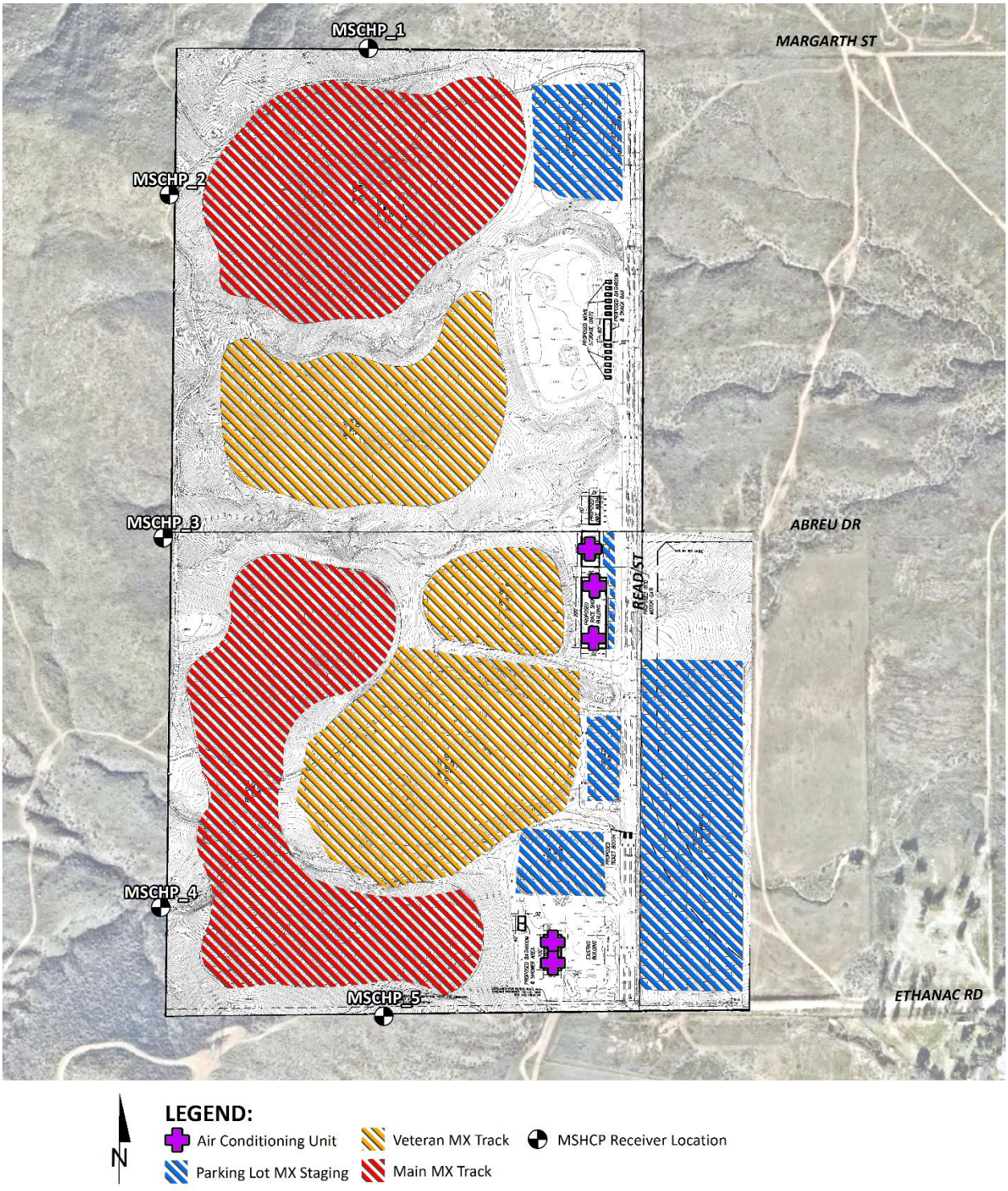


TABLE 9-5: MSCHP OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]	Noise Level Standards (dBA Leq)[3]	Standards Exceeded?[4]
R1	59.7	65	No
R2	63.0	65	No
R3	60.1	65	No
R4	61.2	65	No
R5	62.2	65	No

[1] See Exhibit 9-B for the MSHCP noise receiver locations at the Project site boundaries.
[2] Proposed Project operational (motocross) noise levels are included in Appendix 9.3.
[3] Exterior noise level standards for residential land use (Noise Element Policy N 4.1).
[4] Do the estimated Project operational noise source activities exceed the daytime noise level standards?

Table 9-5 presents a summary of the estimated MSHCP noise levels at each of the five noise receiver locations. As shown on Table 9-5, the Project-related noise levels are expected to range from 59.7 to 63.0 dBA L_{eq}. The analysis shows that the Project-related operational motocross noise levels will satisfy the 65 dBA L_{eq} exterior noise level threshold identified for the proposed MSHCP Conservation Areas. Accordingly, the Project's noise impacts to the adjacent MSHCP Conservation Area would be *less than significant.*

This page intentionally left blank

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 are expected to occur in the following stages:

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

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA). (19). The DEFRA database provides the most recent and comprehensive source of reference construction noise levels. Table 10-1 provides a summary of the DEFRA construction reference noise level measurements expressed in hourly average dBA Leq using the estimated FHWA Roadway Construction Noise Model (RCNM) usage factors (20) to describe the typical construction activities for each stage of Project construction.

EXHIBIT 10-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

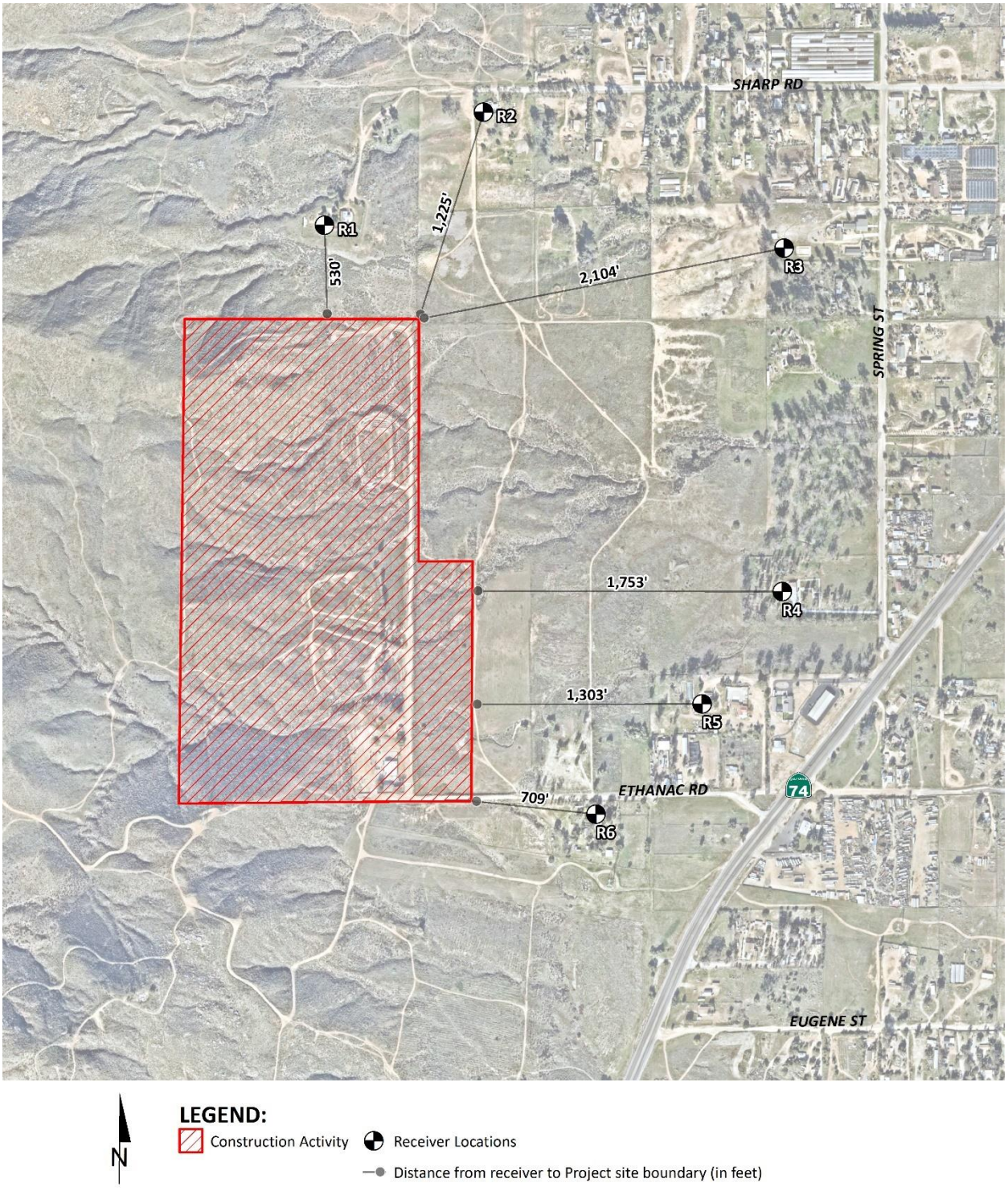


TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Highest Reference Noise Level (dBA L_{eq})
Site Preparation	Crawler Tractors	77	77
	Hauling Trucks	71	
	Rubber Tired Dozers	71	
Grading	Graders	79	79
	Excavators	64	
	Compactors	67	
Building Construction	Cranes	67	72
	Tractors	72	
	Welders	65	
Paving	Pavers	70	70
	Paving Equipment	69	
	Rollers	69	
Architectural Coating	Cranes	67	67
	Air Compressors	67	
	Generator Sets	67	

[1] Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA) expressed in hourly average L_{eq} based on estimated usage factors from the FHWA Roadway Construction Noise Model (RCNM).

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. As shown on Table 10-2, the construction noise levels are expected to range from 50.1 to 69.5 dBA L_{eq}, and the highest construction levels are expected to range from 62.1 to 69.5 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

The construction noise analysis presents a conservative approach with the highest noise-level-producing equipment for each stage of Project construction operating at the closest point from primary construction activity to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	67.5	69.5	62.5	60.5	57.5	69.5
R2	62.5	64.5	57.5	55.5	52.5	64.5
R3	60.1	62.1	55.1	53.1	50.1	62.1
R4	62.0	64.0	57.0	55.0	52.0	64.0
R5	63.7	65.7	58.7	56.7	53.7	65.7
R6	65.5	67.5	60.5	58.5	55.5	67.5

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	69.5	80	No
R2	64.5	80	No
R3	62.1	80	No
R4	64.0	80	No
R5	65.7	80	No
R6	67.5	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed 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. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA). (11) 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 10-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels 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: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Using the vibration source level of construction equipment provided on Table 10-4 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 530 to 2,104 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.000 to 0.001 in/sec RMS and will remain below the County of Riverside threshold of 0.01 in/sec RMS at all receiver locations, as shown on Table 10-5. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

TABLE 10-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver Levels (in/sec) RMS[2]					Threshold (in/sec) RMS[4]	Threshold Exceeded?[5]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	530'	0.000	0.000	0.001	0.001	0.001	0.01	No
R2	1,225'	0.000	0.000	0.000	0.000	0.000	0.01	No
R3	2,104'	0.000	0.000	0.000	0.000	0.000	0.01	No
R4	1,753'	0.000	0.000	0.000	0.000	0.000	0.01	No
R5	1,303'	0.000	0.000	0.000	0.000	0.000	0.01	No
R6	709'	0.000	0.000	0.000	0.000	0.000	0.01	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 10-4. Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[3] Source: County of Riverside General Plan Noise Element, Policy N 16.3.
[4] Does the vibration level exceed the maximum acceptable vibration threshold?

Moreover, the impacts at the site of the nearest sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **Urban Crossroads, Inc.** *JS 63 MX Traffic Impact Analysis.* 2019.
3. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
4. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
5. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
9. **County of Riverside.** *General Plan Noise Element.* December 2015.
10. —. *Ordinance No. 847 - Section 4 Table 1.*
11. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
12. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
13. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
14. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
15. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
16. **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.
17. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
18. **Western Riverside County Regional Conservation Authority.** *Western Riverside County Multiple Species Habitat Conservation Plan.* August 2007.
19. **Department of Environment, Food and Rural Affiars (Defra).** *Update of Noise Database for Prediction of Noise on Construction and Open Sites.* 2004.
20. **FHWA.** *Roadway Construction Noise Model.* January 2006.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed JS 63 MX 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
Principal
URBAN CROSSROADS, INC.
260 E. Baker Street, Suite 200
Costa Mesa, CA 92626
(949) 336-5979
blawson@urbanxroads.com

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

This page intentionally left blank

APPENDIX 3.1:

COUNTY OF RIVERSIDE NOISE ORDINANCE NO. 847

This page intentionally left blank

ORDINANCE NO. 847
(AS AMENDED THROUGH 847.1)
AN ORDINANCE OF THE COUNTY OF RIVERSIDE AMENDING
ORDINANCE NO. 847 REGULATING NOISE

The Board of Supervisors of the County of Riverside Ordains as Follows:

Section 1. INTENT. At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the Board of Supervisors hereby declares that noise shall be regulated in the manner described herein. This ordinance is intended to establish countywide standards regulating noise. This ordinance is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are hereby established.

Section 2. EXEMPTIONS. Sound emanating from the following sources is exempt from the provisions of this ordinance:

a. Facilities owned or operated by or for a governmental agency.
b. Capital improvement projects of a governmental agency.
c. The maintenance or repair of public properties.
d. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile.
e. Public or private schools and school-sponsored activities
f. Agricultural operations on land designated Agriculture in the Riverside County General Plan, or land zoned A-1 (Light Agriculture), A-P (Light Agriculture With Poultry), A-2 (Heavy Agriculture), A-D (Agriculture-Dairy) or C/V (Citrus/Vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile.
g. Wind Energy Conversion Systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348.
h. Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling.
i. Private construction projects located within one-quarter (1/4) of a mile from an inhabited dwelling, provided that:
    1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; and
    2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

j. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7 a.m. and 8 p.m.

k. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems

l. Heating and air conditioning equipment.

m. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare.

n. The discharge of firearms consistent with all state laws.

Section 3. DEFINITIONS. As used in this ordinance, the following terms shall have the following meanings:

a. Audio Equipment. A television, stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

b. Decibel (dB). A unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

1. A-weighting (dBA) means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.
2. Maximum Sound level (L_{max}) means the maximum sound level measured on a sound level meter.

c. Governmental Agency. The United States, the State of California, Riverside County, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

d. Land Use Permit. A discretionary permit issued by Riverside County pursuant to Riverside County Ordinance No. 348.

e. Motor Vehicle. A vehicle that is self-propelled.

f. Motor Vehicle Sound System. A stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

g. Noise. Any loud, discordant or disagreeable sound.

h. Occupied Property. Property upon which is located a residence, business or industrial or manufacturing use.

i. Off-Highway Vehicle. A motor vehicle designed to travel over any terrain.

j. Public Property. Property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

k. Public or Private School. An institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

l. Sensitive Receptor. A land use that is identified as sensitive to noise in the Noise Element of the Riverside County General Plan, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

m. Sound Level Meter. An instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data.

n. Sound Amplifying Equipment. A loudspeaker, microphone, megaphone or other similar device.

Section 4. GENERAL SOUND LEVEL STANDARDS. No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.

TABLE 1 SOUND LEVEL STANDARDS (Db L_{max})					
GENERAL PLAN FOUNDATION COMPONENT	**GENERAL PLAN LAND USE DESIGNATION**	**GENERAL PLAN LAND USE DESIGNATION NAME**	**DENSITY**	**MAXIMUM DECIBEL LEVEL**	
				7am-10pm	**10pm-7am**
Community Development	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
	MDR	Medium Density Residential	2--5	55	45
	MHDR	Medium High Density Residential	5--8	55	45
	HDR	High Density Residential	8--14	55	45
	VHDR	Very High Density Residential	14-20	55	45
	H'TDR	Highest Density Residential	20+	55	45
	CR	Retail Commercial		65	55
	CO	Office Commercial		65	55
	CT	Tourist Commercial		65	55
	CC	Community Center		65	55
	LI	Light Industrial		75	55
	HI	Heavy Industrial		75	75
	BP	Business Park		65	45
	PF	Public Facility		65	45
	SP	Specific Plan-Residential		55	45
		Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55
		Specific Plan-Heavy Industrial		75	75
Rural Community	EDR	Estate Density Residential	2 ac	55	45
	VLDR	Very Low Density Residential	1 ac	55	45
	LDR	Low Density Residential	1/2 ac	55	45
Rural	RR	Rural Residential	5 ac	45	45
	RM	Rural Mountainous	10 ac	45	45
	RD	Rural Desert	10 ac	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation Habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral Resources		75	45

Section 5. SOUND LEVEL MEASUREMENT METHODOLOGY. Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the enforcement officials identified in Section 8. of this ordinance. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually.

Section 6. SPECIAL SOUND SOURCES STANDARDS. The general sound level standards set forth in Section 4. of this ordinance apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this ordinance.

a. Motor Vehicles.
    1. Off-Highway Vehicles.
        i. No person shall operate an off-highway vehicle unless it is equipped with a USDA qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.
        ii. No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than 96 dBA if the vehicle was manufactured on or after January 1, 1986 or is not more that 101 dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.
    2. Sound Systems. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of 10:00 p.m. and 8:00 a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than one hundred (100) feet from the vehicle.

b. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of 10:00 p.m. and 8:00 a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools

or equipment are audible to the human ear at a distance greater than one hundred (100) feet from the power tools or equipment.

c. Audio Equipment. No person shall operate any audio equipment, whether portable or not, between the hours of 10:00 p.m. and 8:00 a.m. such that the equipment is audible to the human ear inside an inhabited dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than one hundred (100) feet from the equipment.

d. Sound Amplifying Equipment and Live Music. No person shall install, use or operate sound amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control.

1. Sound amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m.
2. Sound emanating from sound amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than two hundred (200) feet from the equipment or music.

Section 7. EXCEPTIONS. Exceptions may be requested from the standards set forth in Sections 4. or 6. of this ordinance and may be characterized as construction-related, single event or continuous events exceptions.

a. Application and Processing.

1. Construction-Related Exceptions. An application for a construction-related exception shall be made to and considered by the Director of Building and Safety on forms provided by the Building and Safety Department and shall be accompanied by the appropriate filing fee. No public hearing is required.
2. Single Event Exceptions. An application for a single event exception shall be made to and considered by the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. No public hearing is required.
3. Continuous Events Exceptions. An application for a continuous events exception shall be made to the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous events exception, the Planning Director shall set the matter for public hearing before the Planning Commission, notice of which shall be given as provided in Section 18.26.c. of Riverside County Ordinance No. 348. Notwithstanding the above, an application for a

continuous events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

b. Requirements for Approval. The appropriate decision making body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

c. Appeals. The Director of Building and Safety's decision on an application for a construction-related exception is considered final. The Planning Director's decision on an application for a single event exception is considered final. After making a decision on an application for a continuous events exception, the appropriate decision making body or officer shall mail notice of the decision to the applicant. Within ten (10) calendar days after the mailing of such notice, the applicant or an interested person may appeal the decision to the Board of Supervisors. Upon receipt of an appeal and payment of the appropriate appeal fee, the Clerk of the Board shall set the matter for hearing not less than five (5) days nor more than thirty (30) days thereafter and shall give written notice of the hearing in the same manner as notice of the hearing was given by the appropriate hearing officer or body. The Board of Supervisors shall render its decision within thirty (30) days after the appeal hearing is closed.

d. Effect of a Pending Continuous Events Exception Application. For a period of one hundred and eighty (180) days from the effective date of this ordinance, no person creating any sound prohibited by this ordinance shall be considered in violation of this ordinance if the sound is related to a use that is operating pursuant to an approved land use permit, if an application for a continuous events exception has been filed to sanction the sound and if a decision on the application is pending.

Section 8. ENFORCEMENT. The Riverside County Sheriff and Code Enforcement shall have the primary responsibility for enforcing this ordinance; provided, however, the Sheriff and Code Enforcement may be assisted by the Public Health Department. Violations shall be prosecuted as described in Section 10. of this ordinance, but nothing in this ordinance shall prevent the Sheriff, Code Enforcement or the Department of Public Health from engaging in efforts to obtain voluntary compliance by means of warnings, notices, or educational programs.

Section 9. DUTY TO COOPERATE. No person shall refuse to cooperate with, or obstruct, the enforcement officials identified in Section 8. of this ordinance when they are engaged in the process of enforcing the provisions of this ordinance. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this ordinance.

Section 10. VIOLATIONS AND PENALTIES. Any person who violates any provision of this ordinance once or twice within a one hundred and eighty (180) day period shall be guilty of an infraction. Any person who violates any provision of this ordinance more than twice within a one hundred and eighty (180) day period shall be guilty of a misdemeanor. Each day a violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. Penalties shall not exceed the following amounts.

a. For the first violation within a one hundred and eighty (180) day period the minimum mandatory fine shall be five hundred dollars ($500).
b. For the second violation within a one hundred and eighty (180) day period the minimum mandatory fine shall be seven hundred and fifty dollars ($750).
c. For any further violations within a one hundred and eighty (180) day period the minimum mandatory fine shall be one thousand dollars ($1,000) or imprisonment in the County jail for a period not exceeding six (6) months, or both.

Section 11. SEVERABILITY. If any provision of this ordinance, or the application thereof to any person or circumstance, is held invalid, such invalidity shall not affect the remainder of the ordinance or the application of such provision(s) to other persons or circumstances.

Section 12. SAVINGS CLAUSE. The adoption of this ordinance shall not in any manner affect the prosecution of ordinance violations, which violations were committed prior to the effective date of this ordinance, nor be construed as a waiver of any permit, license, penalty or penal provisions applicable to such violations. The provisions of this ordinance, insofar as they are substantially the same as ordinance provisions previously adopted by Riverside County relating to the same subject matter, shall be construed as restatements and continuations, and not as new enactments.

Section 13. EFFECTIVE DATE. This ordinance shall take effect 30 days after its adoption.

Adopted: 847 Item 3.19 of 04/04/2006 (Eff: 05/04/2006)
Amended: 847.1 Item 3.4 of 06/19/2007 (Eff: 07/19/2007)

APPENDIX 5.1:

STUDY AREA PHOTOS

This page intentionally left blank

L1
33, 45' 11.300000", 117, 17' 14.450000"

L1_E
33, 45' 11.260000", 117, 17' 14.530000"

L1_N
33, 45' 11.220000", 117, 17' 14.390000"

L1_S
33, 45' 11.250000", 117, 17' 14.580000"

L1_W
33, 45' 11.430000", 117, 17' 14.580000"

L2
33, 45' 5.510000", 117, 16' 47.280000"

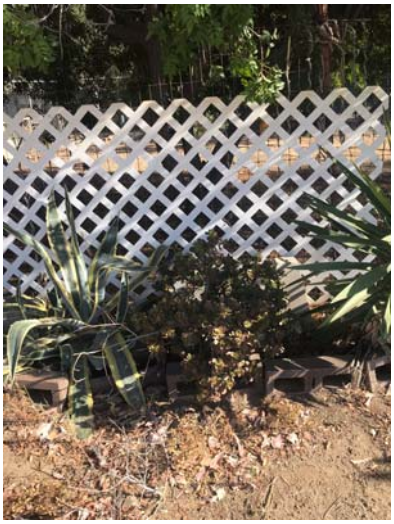
L2_E
33, 45' 4.080000", 117, 16' 53.960000"

L2_N
33, 45' 4.060000", 117, 16' 53.850000"

L2_S
,

L3
,

L3_E
33, 44' 32.990000", 117, 17' 6.430000"



L3_S
33, 44' 33.330000", 117, 17' 6.340000"

JN: 12374 Study Area Photos

L3_W
,

L4
33, 44' 32.970000", 117, 17' 21.560000"

L4_N
33, 44' 33.220000", 117, 17' 21.420000"

L4_S
33, 44' 33.220000", 117, 17' 21.260000"

This page intentionally left blank

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

This page intentionally left blank

24-Hour Noise Level Measurement Summary

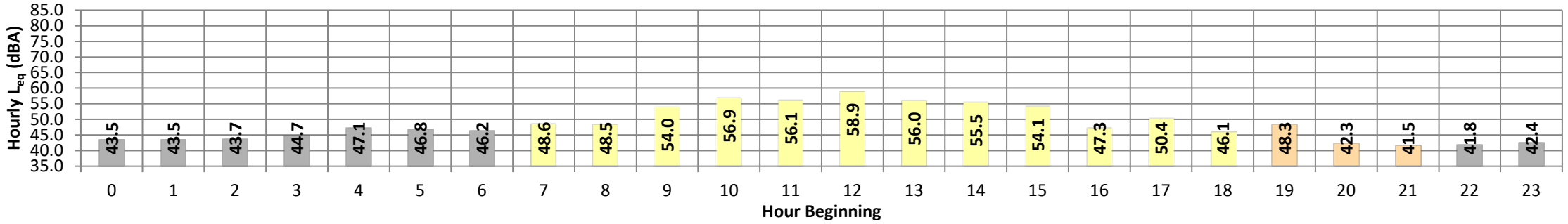
Date: Tuesday, July 30, 2019
Project: Milestone MX Motorcycle Park

Location: L1 - Located north of the Project site on Sharp Road near existing residential home and vacant land.
County of Riverside

Meter: Piccolo I

JN: 12374
Analyst: P. Mara

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	43.5	64.7	41.5	47.0	46.0	44.0	44.0	42.0	41.0	41.0	41.0	41.0	43.5	10.0	53.5
	1	43.5	53.5	41.5	48.0	47.0	45.0	44.0	44.0	41.0	41.0	41.0	41.0	43.5	10.0	53.5
	2	43.7	57.4	41.5	47.0	46.0	44.0	44.0	44.0	43.0	41.0	41.0	41.0	43.7	10.0	53.7
	3	44.7	54.5	41.5	50.0	49.0	46.0	46.0	44.0	44.0	44.0	44.0	42.0	44.7	10.0	54.7
	4	47.1	62.6	44.4	57.0	54.0	49.0	48.0	46.0	44.0	44.0	44.0	44.0	47.1	10.0	57.1
	5	46.8	61.1	44.4	55.0	53.0	49.0	48.0	46.0	44.0	44.0	44.0	44.0	46.8	10.0	56.8
	6	46.2	57.0	44.4	53.0	51.0	49.0	48.0	46.0	44.0	44.0	44.0	44.0	46.2	10.0	56.2
Day	7	48.6	67.8	43.9	60.0	57.0	52.0	49.0	46.0	44.0	44.0	44.0	44.0	48.6	0.0	48.6
	8	48.5	67.0	41.5	58.0	56.0	53.0	52.0	47.0	45.0	44.0	43.0	41.0	48.5	0.0	48.5
	9	54.0	69.9	41.5	63.0	62.0	60.0	58.0	54.0	48.0	41.0	41.0	41.0	54.0	0.0	54.0
	10	56.9	71.5	41.5	67.0	65.0	63.0	61.0	57.0	51.0	41.0	41.0	41.0	56.9	0.0	56.9
	11	56.1	74.1	41.5	66.0	65.0	62.0	60.0	55.0	49.0	41.0	41.0	41.0	56.1	0.0	56.1
	12	58.9	73.2	41.5	68.0	67.0	65.0	63.0	59.0	53.0	43.0	41.0	41.0	58.9	0.0	58.9
	13	56.0	77.5	41.5	66.0	64.0	62.0	60.0	55.0	49.0	41.0	41.0	41.0	56.0	0.0	56.0
	14	55.5	72.7	41.5	65.0	63.0	61.0	59.0	55.0	51.0	42.0	41.0	41.0	55.5	0.0	55.5
	15	54.1	67.3	41.5	61.0	60.0	59.0	58.0	55.0	51.0	43.0	41.0	41.0	54.1	0.0	54.1
	16	47.3	62.7	41.5	57.0	55.0	53.0	51.0	46.0	42.0	41.0	41.0	41.0	47.3	0.0	47.3
	17	50.4	74.6	41.5	58.0	57.0	55.0	54.0	50.0	46.0	41.0	41.0	41.0	50.4	0.0	50.4
	18	46.1	66.3	41.5	56.0	53.0	50.0	49.0	43.0	41.0	41.0	41.0	41.0	46.1	0.0	46.1
Evening	19	48.3	69.7	41.5	62.0	58.0	53.0	50.0	42.0	41.0	41.0	41.0	41.0	48.3	5.0	53.3
	20	42.3	61.9	41.5	48.0	45.0	44.0	42.0	41.0	41.0	41.0	41.0	41.0	42.3	5.0	47.3
	21	41.5	59.2	41.5	46.0	45.0	44.0	42.0	41.0	41.0	41.0	41.0	41.0	41.5	5.0	46.5
Night	22	41.8	58.2	41.5	46.0	45.0	44.0	44.0	41.0	41.0	41.0	41.0	41.0	41.8	10.0	51.8
	23	42.4	50.2	41.5	47.0	46.0	45.0	44.0	41.0	41.0	41.0	41.0	41.0	42.4	10.0	52.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	46.1	62.7	41.5	56.0	53.0	50.0	49.0	43.0	41.0	41.0	41.0	41.0
	Max	58.9	77.5	43.9	68.0	67.0	65.0	63.0	59.0	53.0	44.0	44.0	44.0
Energy Average		54.4	Average:		62.1	60.3	57.9	56.2	51.8	47.5	41.9	41.4	41.3
Evening	Min	41.5	59.2	41.5	46.0	45.0	44.0	42.0	41.0	41.0	41.0	41.0	41.0
	Max	48.3	69.7	41.5	62.0	58.0	53.0	50.0	42.0	41.0	41.0	41.0	41.0
Energy Average		45.2	Average:		52.0	49.3	47.0	44.7	41.3	41.0	41.0	41.0	41.0
Night	Min	41.8	50.2	41.5	46.0	45.0	44.0	44.0	41.0	41.0	41.0	41.0	41.0
	Max	47.1	64.7	44.4	57.0	54.0	49.0	48.0	46.0	44.0	44.0	44.0	44.0
Energy Average		44.8	Average:		50.0	48.6	46.1	45.6	43.8	42.6	42.3	42.3	42.1

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
51.8	**53.5**	**44.8**

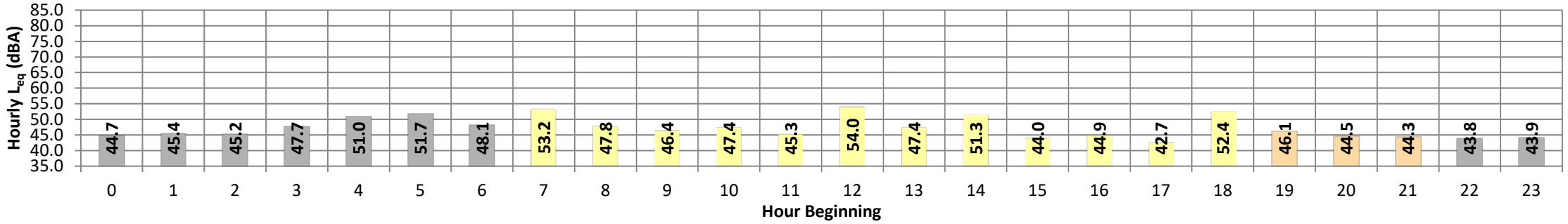
24-Hour CNEL (dBA)

54.2

24-Hour Noise Level Measurement Summary

Date: Tuesday, July 30, 2019
Project: Milestone MX Motorcycle Park
Location: *County of Riverside* L2 - Located east of the Project site near existing single-family residential home.
Meter: Piccolo I
JN: 12374
Analyst: P. Mara

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	44.7	57.1	36.2	52.0	51.0	49.0	48.0	45.0	42.0	39.0	37.0	36.0	44.7	10.0	54.7
	1	45.4	61.4	36.2	55.0	53.0	50.0	48.0	45.0	42.0	39.0	39.0	36.0	45.4	10.0	55.4
	2	45.2	59.4	36.2	53.0	51.0	49.0	48.0	45.0	43.0	39.0	39.0	36.0	45.2	10.0	55.2
	3	47.7	59.1	40.7	56.0	54.0	52.0	51.0	47.0	45.0	43.0	42.0	41.0	47.7	10.0	57.7
	4	51.0	67.6	44.0	56.0	55.0	54.0	53.0	51.0	49.0	46.0	46.0	45.0	51.0	10.0	61.0
	5	51.7	60.5	45.3	57.0	56.0	55.0	54.0	52.0	50.0	48.0	47.0	46.0	51.7	10.0	61.7
	6	48.1	58.3	43.2	55.0	54.0	52.0	51.0	48.0	46.0	45.0	44.0	44.0	48.1	10.0	58.1
Day	7	53.2	72.6	42.1	67.0	63.0	56.0	52.0	47.0	45.0	43.0	43.0	43.0	53.2	0.0	53.2
	8	47.8	64.0	39.0	58.0	55.0	52.0	50.0	46.0	44.0	42.0	41.0	40.0	47.8	0.0	47.8
	9	46.4	61.8	39.1	55.0	52.0	50.0	49.0	46.0	43.0	41.0	40.0	39.0	46.4	0.0	46.4
	10	47.4	63.3	39.1	56.0	55.0	52.0	51.0	47.0	44.0	41.0	40.0	39.0	47.4	0.0	47.4
	11	45.3	59.2	38.2	53.0	52.0	50.0	49.0	45.0	43.0	39.0	39.0	39.0	45.3	0.0	45.3
	12	54.0	77.3	40.6	66.0	60.0	54.0	53.0	49.0	47.0	43.0	42.0	41.0	54.0	0.0	54.0
	13	47.4	64.9	36.2	55.0	54.0	53.0	51.0	46.0	44.0	41.0	40.0	39.0	47.4	0.0	47.4
	14	51.3	75.3	39.0	60.0	56.0	52.0	50.0	46.0	44.0	40.0	40.0	39.0	51.3	0.0	51.3
	15	44.0	58.5	38.7	52.0	50.0	48.0	46.0	44.0	42.0	39.0	39.0	39.0	44.0	0.0	44.0
	16	44.9	58.8	39.0	52.0	51.0	49.0	48.0	45.0	43.0	40.0	39.0	39.0	44.9	0.0	44.9
	17	42.7	54.9	37.1	50.0	49.0	47.0	46.0	42.0	41.0	39.0	39.0	39.0	42.7	0.0	42.7
	18	52.4	76.4	36.2	62.0	57.0	53.0	51.0	45.0	42.0	39.0	39.0	38.0	52.4	0.0	52.4
Evening	19	46.1	62.9	36.2	56.0	54.0	51.0	49.0	44.0	42.0	39.0	39.0	38.0	46.1	5.0	51.1
	20	44.5	61.8	37.7	51.0	49.0	47.0	46.0	44.0	42.0	39.0	39.0	39.0	44.5	5.0	49.5
	21	44.3	61.3	36.2	51.0	50.0	48.0	47.0	44.0	42.0	39.0	39.0	38.0	44.3	5.0	49.3
Night	22	43.8	52.3	37.1	49.0	49.0	48.0	47.0	44.0	42.0	39.0	39.0	38.0	43.8	10.0	53.8
	23	43.9	53.7	36.2	51.0	50.0	48.0	47.0	44.0	42.0	39.0	38.0	36.0	43.9	10.0	53.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	42.7	54.9	36.2	50.0	49.0	47.0	46.0	42.0	41.0	39.0	39.0	38.0
	Max	54.0	77.3	42.1	67.0	63.0	56.0	53.0	49.0	47.0	43.0	43.0	43.0
Energy Average		49.6	Average:		57.2	54.5	51.3	49.7	45.7	43.5	40.6	40.1	39.5
Evening	Min	44.3	61.3	36.2	51.0	49.0	47.0	46.0	44.0	42.0	39.0	39.0	38.0
	Max	46.1	62.9	37.7	56.0	54.0	51.0	49.0	44.0	42.0	39.0	39.0	39.0
Energy Average		45.0	Average:		52.7	51.0	48.7	47.3	44.0	42.0	39.0	39.0	38.3
Night	Min	43.8	52.3	36.2	49.0	49.0	48.0	47.0	44.0	42.0	39.0	37.0	36.0
	Max	51.7	67.6	45.3	57.0	56.0	55.0	54.0	52.0	50.0	48.0	47.0	46.0
Energy Average		47.8	Average:		53.8	52.6	50.8	49.7	46.8	44.6	41.9	41.2	39.8

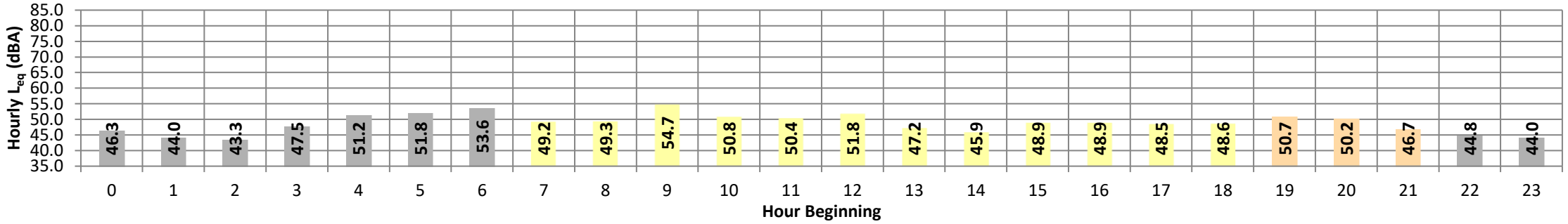
L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
48.6	49.0	47.8

24-Hour CNEL (dBA)
54.5

24-Hour Noise Level Measurement Summary

Date: Tuesday, July 30, 2019
Project: Milestone MX Motorcycle Park
Location: *County of Riverside* L3- Located south of the project on Read Street and Ethanac Road near existing residential home.
Meter: Piccolo II
JN: 12374
Analyst: P. Mara

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	46.3	58.1	36.1	53.5	52.7	51.5	50.6	47.2	44.2	38.9	37.9	37.0	46.3	10.0	56.3
	1	44.0	55.7	35.3	52.1	51.2	49.5	48.1	44.5	41.6	37.6	37.0	36.0	44.0	10.0	54.0
	2	43.3	59.8	33.9	51.8	50.4	48.4	46.9	43.6	40.9	36.2	35.6	34.9	43.3	10.0	53.3
	3	47.5	64.6	36.6	54.9	53.0	51.7	50.7	48.3	46.1	40.0	38.7	37.2	47.5	10.0	57.5
	4	51.2	60.2	42.0	56.4	55.9	54.7	54.2	52.2	50.4	46.9	46.0	44.5	51.2	10.0	61.2
	5	51.8	61.7	45.0	57.5	56.6	55.4	54.7	52.7	50.7	47.8	47.0	46.0	51.8	10.0	61.8
	6	53.6	73.0	45.7	58.9	57.8	56.4	55.8	54.2	52.5	49.3	48.3	47.1	53.6	10.0	63.6
Day	7	49.2	58.6	42.1	55.5	54.3	53.2	52.3	49.9	48.2	45.1	44.3	43.0	49.2	0.0	49.2
	8	49.3	64.8	39.7	61.3	58.8	54.2	51.6	47.6	45.3	42.8	42.3	41.5	49.3	0.0	49.3
	9	54.7	81.1	37.0	68.4	64.3	54.1	50.6	46.6	43.9	40.7	39.6	38.1	54.7	0.0	54.7
	10	50.8	78.0	36.9	57.0	54.2	51.8	50.4	47.2	44.3	40.5	39.7	38.3	50.8	0.0	50.8
	11	50.4	69.3	33.4	60.6	60.4	59.2	58.9	46.8	43.7	38.8	38.0	36.2	50.4	0.0	50.4
	12	51.8	68.0	35.1	61.8	60.6	59.4	59.2	48.4	44.2	38.8	38.0	36.6	51.8	0.0	51.8
	13	47.2	63.0	37.0	55.5	53.8	51.4	50.3	47.5	45.3	41.4	40.5	38.7	47.2	0.0	47.2
	14	45.9	65.2	35.0	54.3	52.5	50.1	49.1	46.2	43.5	39.2	38.1	36.3	45.9	0.0	45.9
	15	48.9	71.0	35.9	61.0	57.6	52.4	50.5	47.4	44.6	40.0	39.2	37.5	48.9	0.0	48.9
	16	48.9	70.1	36.5	59.5	55.7	52.4	50.6	46.4	43.6	40.0	39.1	38.0	48.9	0.0	48.9
	17	48.5	60.3	39.8	54.4	53.5	52.2	51.5	49.3	47.6	44.3	43.4	41.5	48.5	0.0	48.5
	18	48.6	72.6	37.8	54.7	51.0	48.5	47.6	45.5	43.9	41.1	40.5	39.3	48.6	0.0	48.6
Evening	19	50.7	70.4	39.1	62.0	58.7	54.4	52.4	48.7	46.5	43.3	42.6	41.1	50.7	5.0	55.7
	20	50.2	77.6	40.0	58.4	55.5	52.9	51.6	49.1	47.2	44.5	43.6	42.3	50.2	5.0	55.2
	21	46.7	62.5	36.9	54.3	52.4	50.3	49.4	47.1	45.0	41.0	40.1	38.9	46.7	5.0	51.7
Night	22	44.8	52.7	35.4	49.9	49.3	48.5	47.9	46.0	43.8	39.9	38.7	36.4	44.8	10.0	54.8
	23	44.0	53.7	36.2	50.2	49.2	48.0	47.3	44.9	43.0	39.3	38.6	37.5	44.0	10.0	54.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	45.9	58.6	33.4	54.3	51.0	48.5	47.6	45.5	43.5	38.8	38.0	36.2
	Max	54.7	81.1	42.1	68.4	64.3	59.4	59.2	49.9	48.2	45.1	44.3	43.0
Energy Average		50.1	Average:		58.7	56.4	53.2	51.9	47.4	44.8	41.1	40.2	38.8
Evening	Min	46.7	62.5	36.9	54.3	52.4	50.3	49.4	47.1	45.0	41.0	40.1	38.9
	Max	50.7	77.6	40.0	62.0	58.7	54.4	52.4	49.1	47.2	44.5	43.6	42.3
Energy Average		49.5	Average:		58.2	55.5	52.5	51.1	48.3	46.2	42.9	42.1	40.8
Night	Min	43.3	52.7	33.9	49.9	49.2	48.0	46.9	43.6	40.9	36.2	35.6	34.9
	Max	53.6	73.0	45.7	58.9	57.8	56.4	55.8	54.2	52.5	49.3	48.3	47.1
Energy Average		49.0	Average:		53.9	52.9	51.6	50.7	48.2	45.9	41.8	40.9	39.6

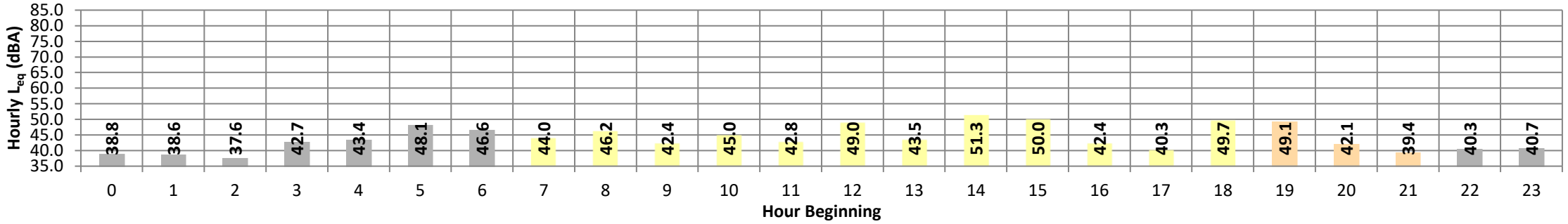
L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
49.7	50.0	49.0

24-Hour CNEL (dBA)
55.8

24-Hour Noise Level Measurement Summary

Date: Tuesday, July 30, 2019
Project: Milestone MX Motorcycle Park
Location: *County of Riverside* L4 - Located on the southern boundary of the Project site near existing vacant land.
Meter: Piccolo I
JN: 12374
Analyst: P. Mara

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	38.8	53.5	36.0	48.0	47.0	44.0	41.0	36.0	36.0	36.0	36.0	36.0	38.8	10.0	48.8
	1	38.6	52.2	36.0	48.0	46.0	42.0	41.0	36.0	36.0	36.0	36.0	36.0	38.6	10.0	48.6
	2	37.6	51.4	36.0	45.0	44.0	40.0	39.0	36.0	36.0	36.0	36.0	36.0	37.6	10.0	47.6
	3	42.7	59.7	36.0	55.0	51.0	45.0	44.0	41.0	39.0	36.0	36.0	36.0	42.7	10.0	52.7
	4	43.4	66.3	38.8	51.0	49.0	47.0	45.0	43.0	41.0	40.0	39.0	39.0	43.4	10.0	53.4
	5	48.1	64.9	38.7	60.0	58.0	52.0	50.0	46.0	43.0	40.0	39.0	39.0	48.1	10.0	58.1
	6	46.6	63.1	38.9	57.0	55.0	51.0	49.0	45.0	41.0	40.0	39.0	39.0	46.6	10.0	56.6
Day	7	44.0	57.8	38.7	53.0	52.0	49.0	47.0	42.0	40.0	39.0	39.0	39.0	44.0	0.0	44.0
	8	46.2	66.6	36.0	57.0	55.0	52.0	49.0	43.0	39.0	36.0	36.0	36.0	46.2	0.0	46.2
	9	42.4	58.1	36.0	50.0	50.0	48.0	46.0	42.0	39.0	36.0	36.0	36.0	42.4	0.0	42.4
	10	45.0	61.1	36.0	57.0	55.0	50.0	49.0	43.0	37.0	36.0	36.0	36.0	45.0	0.0	45.0
	11	42.8	58.4	36.0	52.0	51.0	48.0	47.0	42.0	38.0	36.0	36.0	36.0	42.8	0.0	42.8
	12	49.0	76.9	36.0	59.0	56.0	53.0	51.0	45.0	41.0	36.0	36.0	36.0	49.0	0.0	49.0
	13	43.5	65.2	36.0	54.0	52.0	48.0	47.0	41.0	37.0	36.0	36.0	36.0	43.5	0.0	43.5
	14	51.3	75.3	36.0	62.0	58.0	52.0	49.0	43.0	39.0	36.0	36.0	36.0	51.3	0.0	51.3
	15	50.0	80.7	36.0	58.0	54.0	49.0	47.0	40.0	37.0	36.0	36.0	36.0	50.0	0.0	50.0
	16	42.4	70.9	36.0	52.0	50.0	47.0	45.0	39.0	36.0	36.0	36.0	36.0	42.4	0.0	42.4
	17	40.3	69.7	36.0	48.0	47.0	44.0	43.0	37.0	36.0	36.0	36.0	36.0	40.3	0.0	40.3
	18	49.7	73.8	36.0	60.0	57.0	53.0	50.0	42.0	38.0	36.0	36.0	36.0	49.7	0.0	49.7
Evening	19	49.1	71.6	36.0	60.0	57.0	51.0	49.0	43.0	40.0	36.0	36.0	36.0	49.1	5.0	54.1
	20	42.1	64.3	36.0	50.0	48.0	45.0	43.0	39.0	38.0	36.0	36.0	36.0	42.1	5.0	47.1
	21	39.4	52.2	36.0	49.0	47.0	45.0	43.0	36.0	36.0	36.0	36.0	36.0	39.4	5.0	44.4
Night	22	40.3	52.7	36.0	49.0	48.0	46.0	45.0	39.0	36.0	36.0	36.0	36.0	40.3	10.0	50.3
	23	40.7	55.0	36.0	51.0	49.0	46.0	45.0	39.0	36.0	36.0	36.0	36.0	40.7	10.0	50.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	40.3	57.8	36.0	48.0	47.0	44.0	43.0	37.0	36.0	36.0	36.0	36.0
	Max	51.3	80.7	38.7	62.0	58.0	53.0	51.0	45.0	41.0	39.0	39.0	39.0
Energy Average		46.9	Average:		55.2	53.1	49.4	47.5	41.6	38.1	36.3	36.3	36.3
Evening	Min	39.4	52.2	36.0	49.0	47.0	45.0	43.0	36.0	36.0	36.0	36.0	36.0
	Max	49.1	71.6	36.0	60.0	57.0	51.0	49.0	43.0	40.0	36.0	36.0	36.0
Energy Average		45.5	Average:		53.0	50.7	47.0	45.0	39.3	38.0	36.0	36.0	36.0
Night	Min	37.6	51.4	36.0	45.0	44.0	40.0	39.0	36.0	36.0	36.0	36.0	36.0
	Max	48.1	66.3	38.9	60.0	58.0	52.0	50.0	46.0	43.0	40.0	39.0	39.0
Energy Average		43.3	Average:		51.6	49.7	45.9	44.3	40.1	38.2	37.3	37.0	37.0

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
45.7	46.7	43.3

24-Hour CNEL (dBA)

50.8

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

This page intentionally left blank

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: SR-74
Road Segment: n/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,059 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,009 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.42	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-15.29	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-13.07	-1.23	-1.20	-5.31	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:	70.4	69.6	68.2	62.2	70.6	71.2
Medium Trucks:	66.0	63.1	55.3	64.6	70.7	70.7
Heavy Trucks:	71.8	69.0	61.2	70.4	76.6	76.6
Vehicle Noise:	74.8	72.8	69.2	71.9	78.4	78.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	231	498	1,073	2,311
CNEL:	236	509	1,096	2,361

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: SR-74
Road Segment: s/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,216 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,253 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.08	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.79	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.57	-1.23	-1.20	-5.31	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:	70.9	70.1	68.7	62.7	71.1	71.7
Medium Trucks:	66.5	63.6	55.8	65.0	71.2	71.2
Heavy Trucks:	72.3	69.5	61.7	70.9	77.1	77.1
Vehicle Noise:	75.3	73.3	69.7	72.4	78.9	79.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	249	537	1,158	2,494
CNEL:	255	549	1,183	2,548

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: SR-74
Road Segment: n/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,965 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,156 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.11	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.98	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.76	-0.60	-1.20	-5.35	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	70.5	69.1	63.1	71.5	72.2
Medium Trucks:	66.9	64.1	56.3	65.5	71.6	71.7
Heavy Trucks:	72.8	69.9	62.1	71.3	77.5	77.5
Vehicle Noise:	75.7	73.7	70.1	72.8	79.3	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	246	529	1,141	2,458
CNEL:	251	541	1,165	2,511

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: SR-74
Road Segment: s/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,879 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,227 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.03	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.84	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.62	-4.09	-1.20	-5.14	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:	67.9	67.2	65.8	59.7	68.2	68.8
Medium Trucks:	63.6	60.7	52.9	62.1	68.3	68.3
Heavy Trucks:	69.4	66.6	58.8	68.0	74.1	74.2
Vehicle Noise:	72.4	70.4	66.7	69.5	75.9	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	274	590	1,272	2,740
CNEL:	280	603	1,299	2,799

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,949 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,309 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.19	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.68	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.46	-4.09	-1.20	-5.14	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:	68.1	67.3	65.9	59.9	68.4	69.0
Medium Trucks:	63.7	60.9	53.1	62.3	68.4	68.5
Heavy Trucks:	69.6	66.7	58.9	68.1	74.3	74.3
Vehicle Noise:	72.5	70.5	66.9	69.6	76.1	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	281	605	1,303	2,808
CNEL:	287	618	1,331	2,868

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,404 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,267 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.11	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.76	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.54	-4.09	-1.20	-5.14	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:	68.0	67.3	65.8	59.8	68.3	68.9
Medium Trucks:	63.6	60.8	53.0	62.2	68.4	68.4
Heavy Trucks:	69.5	66.6	58.9	68.1	74.2	74.3
Vehicle Noise:	72.4	70.5	66.8	69.6	76.0	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	277	598	1,287	2,773
CNEL:	283	610	1,315	2,833

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Meadowbrook Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,060 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,549 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.61	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.25	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.03	-4.09	-1.20	-5.14	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:	68.5	67.8	66.4	60.3	68.8	69.4
Medium Trucks:	64.1	61.3	53.5	62.7	68.9	68.9
Heavy Trucks:	70.0	67.1	59.4	68.6	74.7	74.8
Vehicle Noise:	73.0	71.0	67.3	70.1	76.5	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	300	646	1,392	2,999
CNEL:	306	660	1,422	3,063

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: JS 63 MX
Road Name: Ethanac Rd. | Job Number: 12374
Road Segment: w/o SR-74

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	162 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	12 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.47	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-37.71	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-41.67	1.92	-1.20	-5.61	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:	46.7	45.8	44.5	38.5	46.9	47.6
Medium Trucks:	40.7	38.0	30.5	39.2	45.4	45.4
Heavy Trucks:	42.1	39.1	35.7	40.4	46.6	46.7
Vehicle Noise:	48.7	47.2	45.2	44.2	51.1	51.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	2	4	9	20
CNEL:	2	5	10	21

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,248 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,024 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.39	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-15.25	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-13.04	-1.23	-1.20	-5.31	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:	70.4	69.6	68.2	62.2	70.7	71.3
Medium Trucks:	66.0	63.2	55.4	64.6	70.7	70.8
Heavy Trucks:	71.9	69.0	61.2	70.4	76.6	76.6
Vehicle Noise:	74.8	72.8	69.2	71.9	78.4	78.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	232	500	1,078	2,323
CNEL:	237	511	1,101	2,372

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,426 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,269 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.11	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.76	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.54	-1.23	-1.20	-5.31	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:	70.9	70.1	68.7	62.7	71.1	71.8
Medium Trucks:	66.5	63.7	55.9	65.1	71.2	71.3
Heavy Trucks:	72.4	69.5	61.7	70.9	77.1	77.1
Vehicle Noise:	75.3	73.3	69.7	72.4	78.9	79.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	251	540	1,163	2,506
CNEL:	256	552	1,188	2,560

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,175 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,172 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.08	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.95	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.73	-0.60	-1.20	-5.35	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	70.6	69.1	63.1	71.6	72.2
Medium Trucks:	66.9	64.1	56.3	65.5	71.7	71.7
Heavy Trucks:	72.8	69.9	62.2	71.4	77.5	77.6
Vehicle Noise:	75.7	73.8	70.1	72.9	79.3	79.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	247	532	1,146	2,470
CNEL:	252	544	1,171	2,523

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,089 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,243 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.06	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.81	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.59	-4.09	-1.20	-5.14	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:	68.0	67.2	65.8	59.8	68.2	68.9
Medium Trucks:	63.6	60.7	53.0	62.2	68.3	68.3
Heavy Trucks:	69.4	66.6	58.8	68.0	74.2	74.2
Vehicle Noise:	72.4	70.4	66.8	69.5	76.0	76.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	275	593	1,278	2,754
CNEL:	281	606	1,306	2,813

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,159 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,325 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.22	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.65	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.43	-4.09	-1.20	-5.14	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:	68.1	67.4	66.0	59.9	68.4	69.0
Medium Trucks:	63.7	60.9	53.1	62.3	68.5	68.5
Heavy Trucks:	69.6	66.8	59.0	68.2	74.3	74.4
Vehicle Noise:	72.6	70.6	66.9	69.7	76.1	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	282	608	1,309	2,821
CNEL:	288	621	1,337	2,881

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,614 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,283 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.14	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.73	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.51	-4.09	-1.20	-5.14	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:	68.1	67.3	65.9	59.9	68.3	68.9
Medium Trucks:	63.7	60.8	53.0	62.2	68.4	68.4
Heavy Trucks:	69.5	66.7	58.9	68.1	74.3	74.3
Vehicle Noise:	72.5	70.5	66.9	69.6	76.1	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	279	600	1,293	2,787
CNEL:	285	613	1,321	2,847

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Meadowbrook Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,249 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,564 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.64	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.23	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.01	-4.09	-1.20	-5.14	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:	68.6	67.8	66.4	60.4	68.8	69.4
Medium Trucks:	64.2	61.3	53.5	62.7	68.9	68.9
Heavy Trucks:	70.0	67.2	59.4	68.6	74.8	74.8
Vehicle Noise:	73.0	71.0	67.4	70.1	76.6	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	301	649	1,397	3,010
CNEL:	308	663	1,427	3,075

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P | Project Name: JS 63 MX
Road Name: Ethanac Rd. | Job Number: 12374
Road Segment: w/o SR-74

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	582 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	45 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-14.92	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-32.16	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-36.11	1.92	-1.20	-5.61	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:	52.3	51.4	50.1	44.1	52.5	53.1
Medium Trucks:	46.3	43.5	36.0	44.8	50.9	51.0
Heavy Trucks:	47.6	44.7	41.3	45.9	52.1	52.2
Vehicle Noise:	54.3	52.8	50.8	49.8	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	48
CNEL:	5	11	23	50

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,841 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,069 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.29	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-15.16	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.94	-1.23	-1.20	-5.31	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:	70.5	69.7	68.3	62.3	70.8	71.4
Medium Trucks:	66.1	63.3	55.5	64.7	70.8	70.9
Heavy Trucks:	72.0	69.1	61.3	70.5	76.7	76.7
Vehicle Noise:	74.9	72.9	69.3	72.0	78.5	78.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	236	508	1,094	2,357
CNEL:	241	519	1,118	2,408

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,093 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,320 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.21	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.66	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.44	-1.23	-1.20	-5.31	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:	71.0	70.2	68.8	62.8	71.2	71.9
Medium Trucks:	66.6	63.7	56.0	65.2	71.3	71.4
Heavy Trucks:	72.5	69.6	61.8	71.0	77.2	77.2
Vehicle Noise:	75.4	73.4	69.8	72.5	79.0	79.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	254	548	1,181	2,544
CNEL:	260	560	1,206	2,599

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,804 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,221 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.02	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.85	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.63	-0.60	-1.20	-5.35	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:	71.4	70.6	69.2	63.2	71.7	72.3
Medium Trucks:	67.0	64.2	56.4	65.6	71.8	71.8
Heavy Trucks:	72.9	70.0	62.3	71.5	77.6	77.7
Vehicle Noise:	75.8	73.9	70.2	73.0	79.4	79.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	251	540	1,163	2,507
CNEL:	256	552	1,188	2,560

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,745 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,293 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.16	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.71	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.49	-4.09	-1.20	-5.14	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:	68.1	67.3	65.9	59.9	68.3	69.0
Medium Trucks:	63.7	60.8	53.1	62.3	68.4	68.4
Heavy Trucks:	69.5	66.7	58.9	68.1	74.3	74.3
Vehicle Noise:	72.5	70.5	66.9	69.6	76.1	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	279	602	1,297	2,795
CNEL:	286	615	1,325	2,855

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,847 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,378 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.31	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.55	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.33	-4.09	-1.20	-5.14	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:	68.2	67.5	66.1	60.0	68.5	69.1
Medium Trucks:	63.8	61.0	53.2	62.4	68.6	68.6
Heavy Trucks:	69.7	66.8	59.1	68.3	74.4	74.5
Vehicle Noise:	72.7	70.7	67.0	69.8	76.2	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	286	617	1,329	2,863
CNEL:	293	630	1,358	2,925

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,286 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,335 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.23	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.63	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.41	-4.09	-1.20	-5.14	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:	68.2	67.4	66.0	60.0	68.4	69.0
Medium Trucks:	63.8	60.9	53.1	62.3	68.5	68.5
Heavy Trucks:	69.6	66.8	59.0	68.2	74.3	74.4
Vehicle Noise:	72.6	70.6	67.0	69.7	76.2	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	283	609	1,313	2,829
CNEL:	289	623	1,341	2,890

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Meadowbrook Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,052 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,625 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.74	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.12	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-11.91	-4.09	-1.20	-5.14	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:	68.7	67.9	66.5	60.5	68.9	69.5
Medium Trucks:	64.3	61.4	53.6	62.8	69.0	69.0
Heavy Trucks:	70.1	67.3	59.5	68.7	74.9	74.9
Vehicle Noise:	73.1	71.1	67.5	70.2	76.7	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	306	659	1,420	3,058
CNEL:	312	673	1,450	3,124

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA | Project Name: JS 63 MX
Road Name: Ethanac Rd. | Job Number: 12374
Road Segment: w/o SR-74

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	167 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	13 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.34	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-37.58	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-41.54	1.92	-1.20	-5.61	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:	46.9	46.0	44.7	38.6	47.1	47.7
Medium Trucks:	40.9	38.1	30.6	39.3	45.5	45.6
Heavy Trucks:	42.2	39.3	35.9	40.5	46.7	46.8
Vehicle Noise:	48.9	47.4	45.3	44.3	51.3	51.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	2	4	10	21
CNEL:	2	5	10	22

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: SR-74
Road Segment: n/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,030 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,084 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.26	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-15.13	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.91	-1.23	-1.20	-5.31	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:	70.5	69.8	68.3	62.3	70.8	71.4
Medium Trucks:	66.1	63.3	55.5	64.7	70.9	70.9
Heavy Trucks:	72.0	69.1	61.4	70.6	76.7	76.8
Vehicle Noise:	74.9	73.0	69.3	72.1	78.5	78.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	237	510	1,099	2,368
CNEL:	242	521	1,123	2,419

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: SR-74
Road Segment: s/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,303 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,336 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.24	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.63	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.41	-1.23	-1.20	-5.31	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:	71.0	70.2	68.8	62.8	71.3	71.9
Medium Trucks:	66.6	63.8	56.0	65.2	71.4	71.4
Heavy Trucks:	72.5	69.6	61.9	71.1	77.2	77.3
Vehicle Noise:	75.4	73.5	69.8	72.6	79.0	79.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	256	551	1,186	2,556
CNEL:	261	563	1,212	2,611

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: SR-74
Road Segment: n/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,014 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,237 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.05	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.82	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.60	-0.60	-1.20	-5.35	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:	71.4	70.7	69.3	63.2	71.7	72.3
Medium Trucks:	67.1	64.2	56.4	65.6	71.8	71.8
Heavy Trucks:	72.9	70.1	62.3	71.5	77.7	77.7
Vehicle Noise:	75.9	73.9	70.2	73.0	79.5	79.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	252	543	1,169	2,519
CNEL:	257	554	1,194	2,573

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP
Road Name: SR-74
Road Segment: s/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,955 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,310 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.19	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.68	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.46	-4.09	-1.20	-5.14	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:	68.1	67.3	65.9	59.9	68.4	69.0
Medium Trucks:	63.7	60.9	53.1	62.3	68.4	68.5
Heavy Trucks:	69.6	66.7	58.9	68.1	74.3	74.3
Vehicle Noise:	72.5	70.5	66.9	69.6	76.1	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	281	605	1,303	2,808
CNEL:	287	618	1,331	2,868

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,057 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,394 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.34	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.52	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.31	-4.09	-1.20	-5.14	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:	68.3	67.5	66.1	60.1	68.5	69.1
Medium Trucks:	63.9	61.0	53.2	62.4	68.6	68.6
Heavy Trucks:	69.7	66.9	59.1	68.3	74.5	74.5
Vehicle Noise:	72.7	70.7	67.1	69.8	76.3	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	288	620	1,335	2,876
CNEL:	294	633	1,364	2,938

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,496 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,351 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.26	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.60	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.38	-4.09	-1.20	-5.14	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:	68.2	67.4	66.0	60.0	68.4	69.1
Medium Trucks:	63.8	60.9	53.2	62.4	68.5	68.6
Heavy Trucks:	69.6	66.8	59.0	68.2	74.4	74.4
Vehicle Noise:	72.6	70.6	67.0	69.7	76.2	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	284	612	1,319	2,842
CNEL:	290	625	1,347	2,903

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Meadowbrook Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,241 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,640 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.77	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.10	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-11.88	-4.09	-1.20	-5.14	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:	68.7	67.9	66.5	60.5	68.9	69.6
Medium Trucks:	64.3	61.4	53.7	62.9	69.0	69.1
Heavy Trucks:	70.2	67.3	59.5	68.7	74.9	74.9
Vehicle Noise:	73.1	71.1	67.5	70.2	76.7	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	307	661	1,425	3,070
CNEL:	314	676	1,456	3,136

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAP | Project Name: JS 63 MX
Road Name: Ethanac Rd. | Job Number: 12374
Road Segment: w/o SR-74

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	587 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	45 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-14.88	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-32.12	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-36.08	1.92	-1.20	-5.61	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:	52.3	51.4	50.1	44.1	52.5	53.2
Medium Trucks:	46.3	43.6	36.1	44.8	51.0	51.0
Heavy Trucks:	47.6	44.7	41.3	46.0	52.2	52.3
Vehicle Noise:	54.3	52.8	50.8	49.8	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	48
CNEL:	5	11	23	50

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: n/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,241 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,177 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.07	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.94	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.72	-1.23	-1.20	-5.31	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:	70.7	69.9	68.5	62.5	71.0	71.6
Medium Trucks:	66.3	63.5	55.7	64.9	71.1	71.1
Heavy Trucks:	72.2	69.3	61.6	70.8	76.9	76.9
Vehicle Noise:	75.1	73.2	69.5	72.2	78.7	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	244	525	1,132	2,439
CNEL:	249	537	1,156	2,491

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: s/o Theda St.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,643 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,440 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.42	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.44	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.22	-1.23	-1.20	-5.31	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	70.4	69.0	63.0	71.5	72.1
Medium Trucks:	66.8	64.0	56.2	65.4	71.5	71.6
Heavy Trucks:	72.7	69.8	62.0	71.3	77.4	77.4
Vehicle Noise:	75.6	73.6	70.0	72.7	79.2	79.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	263	567	1,221	2,631
CNEL:	269	579	1,247	2,687

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: n/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,352 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,340 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.24	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.62	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.40	-0.60	-1.20	-5.35	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	70.9	69.5	63.4	71.9	72.5
Medium Trucks:	67.3	64.4	56.6	65.8	72.0	72.0
Heavy Trucks:	73.1	70.3	62.5	71.7	77.8	77.9
Vehicle Noise:	76.1	74.1	70.4	73.2	79.7	79.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	260	559	1,205	2,596
CNEL:	265	571	1,231	2,651

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: s/o Ethanac Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,293 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,413 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.38	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.49	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.27	-4.09	-1.20	-5.14	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:	68.3	67.5	66.1	60.1	68.6	69.2
Medium Trucks:	63.9	61.1	53.3	62.5	68.6	68.7
Heavy Trucks:	69.8	66.9	59.1	68.3	74.5	74.5
Vehicle Noise:	72.7	70.7	67.1	69.8	76.3	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	289	623	1,342	2,891
CNEL:	295	636	1,371	2,953

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: n/o River Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,937 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,462 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.46	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.40	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.18	-4.09	-1.20	-5.14	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:	68.4	67.6	66.2	60.2	68.6	69.3
Medium Trucks:	64.0	61.1	53.4	62.6	68.7	68.8
Heavy Trucks:	69.8	67.0	59.2	68.4	74.6	74.6
Vehicle Noise:	72.8	70.8	67.2	69.9	76.4	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	293	631	1,360	2,931
CNEL:	299	645	1,390	2,994

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: s/o River Rd.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,226 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,408 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.37	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.50	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.28	-4.09	-1.20	-5.14	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:	68.3	67.5	66.1	60.1	68.5	69.2
Medium Trucks:	63.9	61.0	53.3	62.5	68.6	68.7
Heavy Trucks:	69.8	66.9	59.1	68.3	74.5	74.5
Vehicle Noise:	72.7	70.7	67.1	69.8	76.3	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	289	622	1,340	2,887
CNEL:	295	635	1,369	2,949

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: SR-74
Road Segment: s/o Meadowbrook Av.
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,694 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,675 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.82	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.04	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-11.82	-4.09	-1.20	-5.14	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:	68.7	68.0	66.6	60.5	69.0	69.6
Medium Trucks:	64.3	61.5	53.7	62.9	69.1	69.1
Heavy Trucks:	70.2	67.4	59.6	68.8	74.9	75.0
Vehicle Noise:	73.2	71.2	67.5	70.3	76.7	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	310	667	1,437	3,097
CNEL:	316	682	1,468	3,164

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC
Road Name: Ethanac Rd.
Road Segment: w/o SR-74
Project Name: JS 63 MX
Job Number: 12374

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	167 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	13 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.34	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-37.58	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-41.54	1.92	-1.20	-5.61	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:	46.9	46.0	44.7	38.6	47.1	47.7
Medium Trucks:	40.9	38.1	30.6	39.3	45.5	45.6
Heavy Trucks:	42.2	39.3	35.9	40.5	46.7	46.8
Vehicle Noise:	48.9	47.4	45.3	44.3	51.3	51.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	2	4	10	21
CNEL:	2	5	10	22

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,430 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,192 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	-0.04	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.91	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.69	-1.23	-1.20	-5.31	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:	70.7	70.0	68.6	62.5	71.0	71.6
Medium Trucks:	66.4	63.5	55.7	64.9	71.1	71.1
Heavy Trucks:	72.2	69.4	61.6	70.8	76.9	77.0
Vehicle Noise:	75.2	73.2	69.5	72.3	78.7	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	245	528	1,137	2,449
CNEL:	250	539	1,161	2,502

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Theda St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,853 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,456 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	64.0 feet
Centerline Dist. to Observer:	64.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	59.540
Medium Trucks:	59.391
Heavy Trucks:	59.406

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.45	-1.24	-1.20	-4.70	0.000	0.000
Medium Trucks:	83.68	-14.41	-1.22	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.20	-1.23	-1.20	-5.31	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	70.5	69.1	63.0	71.5	72.1
Medium Trucks:	66.8	64.0	56.2	65.4	71.6	71.6
Heavy Trucks:	72.7	69.9	62.1	71.3	77.4	77.5
Vehicle Noise:	75.7	73.7	70.0	72.8	79.2	79.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	264	569	1,226	2,642
CNEL:	270	582	1,253	2,699

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,562 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,356 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.27	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	83.68	-14.59	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.37	-0.60	-1.20	-5.35	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:	71.7	70.9	69.5	63.5	71.9	72.6
Medium Trucks:	67.3	64.4	56.7	65.9	72.0	72.1
Heavy Trucks:	73.1	70.3	62.5	71.7	77.9	77.9
Vehicle Noise:	76.1	74.1	70.5	73.2	79.7	79.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	261	562	1,210	2,608
CNEL:	266	574	1,236	2,664

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Ethanac Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,503 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,429 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.41	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.46	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.24	-4.09	-1.20	-5.14	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:	68.3	67.6	66.1	60.1	68.6	69.2
Medium Trucks:	63.9	61.1	53.3	62.5	68.7	68.7
Heavy Trucks:	69.8	66.9	59.2	68.4	74.5	74.6
Vehicle Noise:	72.7	70.8	67.1	69.9	76.3	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	290	626	1,348	2,904
CNEL:	297	639	1,377	2,966

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: n/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,147 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,479 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.49	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.37	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.16	-4.09	-1.20	-5.14	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:	68.4	67.6	66.2	60.2	68.7	69.3
Medium Trucks:	64.0	61.2	53.4	62.6	68.7	68.8
Heavy Trucks:	69.9	67.0	59.2	68.5	74.6	74.6
Vehicle Noise:	72.8	70.9	67.2	69.9	76.4	76.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	294	634	1,366	2,943
CNEL:	301	648	1,396	3,007

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o River Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,436 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,424 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.40	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.47	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-12.25	-4.09	-1.20	-5.14	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:	68.3	67.5	66.1	60.1	68.6	69.2
Medium Trucks:	63.9	61.1	53.3	62.5	68.7	68.7
Heavy Trucks:	69.8	66.9	59.1	68.4	74.5	74.5
Vehicle Noise:	72.7	70.8	67.1	69.8	76.3	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	290	625	1,346	2,900
CNEL:	296	638	1,375	2,962

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: SR-74 | Job Number: 12374
Road Segment: s/o Meadowbrook Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,883 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	2,689 vehicles
Vehicle Speed:	60 mph
Near/Far Lane Distance:	120 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	110.0 feet
Centerline Dist. to Observer:	110.0 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:	77.5%	14.0%	10.5%	92.00%
Medium Trucks:	48.0%	2.0%	50.0%	3.00%
Heavy Trucks:	48.0%	2.0%	50.0%	5.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	92.331
Medium Trucks:	92.235
Heavy Trucks:	92.244

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	73.22	0.85	-4.10	-1.20	-4.78	0.000	0.000
Medium Trucks:	83.68	-14.02	-4.09	-1.20	-4.88	0.000	0.000
Heavy Trucks:	87.33	-11.80	-4.09	-1.20	-5.14	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:	68.8	68.0	66.6	60.6	69.0	69.7
Medium Trucks:	64.4	61.5	53.7	63.0	69.1	69.1
Heavy Trucks:	70.2	67.4	59.6	68.8	75.0	75.0
Vehicle Noise:	73.2	71.2	67.6	70.3	76.8	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	311	670	1,443	3,108
CNEL:	318	684	1,474	3,175

Tuesday, January 21, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAPC | Project Name: JS 63 MX
Road Name: Ethanac Rd. | Job Number: 12374
Road Segment: w/o SR-74

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	587 vehicles
Peak Hour Percentage:	7.71%
Peak Hour Volume:	45 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 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:	75.5%	14.0%	10.5%	97.42%
Medium Trucks:	48.9%	2.2%	48.9%	1.84%
Heavy Trucks:	47.3%	5.4%	47.3%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-14.88	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-32.12	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-36.08	1.92	-1.20	-5.61	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:	52.3	51.4	50.1	44.1	52.5	53.2
Medium Trucks:	46.3	43.6	36.1	44.8	51.0	51.0
Heavy Trucks:	47.6	44.7	41.3	46.0	52.2	52.3
Vehicle Noise:	54.3	52.8	50.8	49.8	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	22	48
CNEL:	5	11	23	50

Tuesday, January 21, 2020

APPENDIX 9.1:

REFERENCE NOISE SOURCE PHOTOS

This page intentionally left blank

JN:12374 Reference Noise Source Photos

Main Track_1
34, 2' 4.520000"117, 22' 7.970000"

Main Track_2
34, 2' 4.520000"117, 22' 7.970000"

Main Track_3
34, 2' 4.520000"117, 22' 7.970000"

Main Track_4
34, 1' 25.140000"117, 22' 7.370000"

Main Track_5
34, 1' 24.690000"117, 22' 7.420000"

Main Track_6
34, 1' 24.940000"117, 22' 7.180000"

JN:12374 Reference Noise Source Photos

Parking Lot_1
34, 1' 22.710000"117, 22' 15.110000"

Parking Lot_2
34, 1' 23.130000"117, 22' 15.090000"

Parking Lot_3
34, 1' 23.250000"117, 22' 14.810000"

Parking Lot_4
34, 1' 23.400000"117, 22' 14.650000"

Parking Lot_5
34, 1' 22.510000"117, 22' 15.580000"

Veteran Track_1
34, 1' 29.150000"117, 22' 9.540000"

JN:12374 Reference Noise Source Photos

Veteran Track_2
34, 1' 29.180000"117, 22' 9.650000"

Veteran Track_3
34, 1' 29.170000"117, 22' 9.650000"

Veteran Track_4
34, 1' 29.150000"117, 22' 9.650000"

Veteran Track_5
34, 1' 29.110000"117, 22' 9.680000"

This page intentionally left blank

APPENDIX 9.2:

CADNAA NOISE MODEL

This page intentionally left blank

12374

CadnaA Noise Prediction Model
12374_02.cna
Date:
06.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	54.7	54.7	61.3	55.0	45.0	0.0				1781.00	a	6245498.07	2218602.73	1781.00
R2		R2	50.0	50.0	56.7	55.0	45.0	0.0				1724.00	a	6246395.88	2219241.56	1724.00
R3		R3	48.0	48.0	54.7	55.0	45.0	0.0				1635.00	a	6248096.54	2218474.47	1635.00
R4		R4	49.8	49.8	56.5	55.0	45.0	0.0				1657.00	a	6248085.44	2216533.33	1657.00
R5		R5	52.1	52.1	58.8	55.0	45.0	0.0				1675.00	a	6247632.49	2215899.56	1675.00
R6		R6	53.3	53.3	60.0	55.0	45.0	0.0				1713.00	a	6247032.45	2215276.73	1713.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245770.08	2215547.71	1750.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245770.95	2215488.82	1749.92
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245885.50	2216405.75	1752.72
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245888.36	2216553.39	1751.87
POINTSOURCE		AC05	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245875.03	2216658.17	1751.66

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
AREASOURCE		MAIN01	117.8	117.8	117.8	70.7	70.7	70.7	Lw	117.8		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		MAIN02	117.8	117.8	117.8	71.1	71.1	71.1	Lw	117.8		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING01	105.1	105.1	105.1	58.5	58.5	58.5	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING02	105.1	105.1	105.1	72.0	72.0	72.0	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING03	105.1	105.1	105.1	68.9	68.9	68.9	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING04	105.1	105.1	105.1	66.4	66.4	66.4	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING05	105.1	105.1	105.1	76.8	76.8	76.8	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN01	113.5	113.5	113.5	67.8	67.8	67.8	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN02	113.5	113.5	113.5	73.9	73.9	73.9	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN03	113.5	113.5	113.5	68.4	68.4	68.4	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			

This page intentionally left blank

APPENDIX 9.3:

MSCHP CADNAA NOISE MODEL

This page intentionally left blank

12374

CadnaA Noise Prediction Model
12374_03_MSHCP.cna
Date:
07.02.20
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
MSCHP_1		MSCHP_1	59.7	59.7	66.4	65.0	0.0	0.0				1830.00	a	6245262.82	2218075.55	1830.00
MSCHP_2		MSCHP_2	63.0	63.0	69.7	65.0	0.0	0.0				2000.00	a	6244700.72	2217662.76	2000.00
MSCHP_3		MSCHP_3	60.1	60.1	66.8	65.0	0.0	0.0				1900.00	a	6244683.37	2216693.33	1900.00
MSCHP_4		MSCHP_4	61.2	61.2	67.9	65.0	0.0	0.0				1805.00	a	6244676.10	2215649.22	1805.00
MSCHP_5		MSCHP_5	62.2	62.2	68.8	65.0	0.0	0.0				1855.00	a	6245306.26	2215341.83	1855.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245770.08	2215547.71	1750.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245770.95	2215488.82	1749.92
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245885.50	2216405.75	1752.72
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245888.36	2216553.39	1751.87
POINTSOURCE		AC05	88.9	88.9	88.9	Lw	88.9		0.0	0.0	0.0							0.0	500	(none)	15.00	r	6245875.03	2216658.17	1751.66

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
AREASOURCE		MAIN01	117.8	117.8	117.8	70.7	70.7	70.7	Lw	117.8		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		MAIN02	117.8	117.8	117.8	71.1	71.1	71.1	Lw	117.8		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING01	105.1	105.1	105.1	58.5	58.5	58.5	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING02	105.1	105.1	105.1	72.0	72.0	72.0	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING03	105.1	105.1	105.1	68.9	68.9	68.9	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING04	105.1	105.1	105.1	66.4	66.4	66.4	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		PARKING05	105.1	105.1	105.1	76.8	76.8	76.8	Lw	105.1		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN01	113.5	113.5	113.5	67.8	67.8	67.8	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN02	113.5	113.5	113.5	73.9	73.9	73.9	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			
AREASOURCE		VETERAN03	113.5	113.5	113.5	68.4	68.4	68.4	Lw	113.5		0.0	0.0	0.0							0.0	500	(none)			

This page intentionally left blank

APPENDIX 10.1:

CONSTRUCTION CADNAA NOISE MODEL

This page intentionally left blank

12374

CadnaA Noise Prediction Model
12374_09 Construction.cna
Date:
20.08.21
Analyst:
B. Lawson

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	69.5	69.5	76.1	0.0	0.0	0.0		x	Total	5.00	a	6245498.07	2218602.73	5.00
RECEIVERS		R2	64.5	64.5	71.2	0.0	0.0	0.0		x	Total	5.00	a	6246395.88	2219241.56	5.00
RECEIVERS		R3	62.1	62.1	68.8	0.0	0.0	0.0		x	Total	5.00	a	6248096.54	2218474.47	5.00
RECEIVERS		R4	64.0	64.0	70.7	0.0	0.0	0.0		x	Total	5.00	a	6248085.44	2216533.33	5.00
RECEIVERS		R5	65.7	65.7	72.3	0.0	0.0	0.0		x	Total	5.00	a	6247632.49	2215899.56	5.00
RECEIVERS		R6	67.5	67.5	74.2	0.0	0.0	0.0		x	Total	5.00	a	6247032.45	2215276.73	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft^2)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
SITEBOUNDARY		SITEBOUNDARY00001	134.8	134.8	134.8	79.0	79.0	79.0	Lw''	79		0.0	0.0	0.0							0.0	500	(none)			

This page intentionally left blank