KTM French Valley

NOISE IMPACT ANALYSIS

COUNTY OF RIVERSIDE

PREPARED BY:

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

Alex Wolfe, INCE
awolfe@urbanxroads.com
(949) 336-5977

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit 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
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	KTM French Valley
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SR-79	State Route 79
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed KTM French Valley development ("Project"). The Project site is located on the northeast corner of Winchester Road (State Route 79 (SR-79)) and Hunter Road in unincorporated County of Riverside. The Project is proposed to consist of the development of 32,292 square feet of warehouse use, 65,100 square feet of office use, and a 66,306 square foot research and development center. This study has been prepared to satisfy applicable County of Riverside noise standards; and derives 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 proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 10 roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *KTM French Valley Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Existing plus Ambient Growth (EA) 2020, and EA plus Cumulative Developments (EAC) 2020 conditions. The analysis shows that the Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the KTM French Valley site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed KTM French Valley are anticipated to include roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity. Since the nearby sensitive receiver locations are located in the City of Murrieta, the City of Murrieta Municipal Code exterior noise level standards are used in this analysis to determine potential impacts. The operational noise analysis shows that the unmitigated Project-related stationary-source noise levels will satisfy the City of Murrieta exterior noise level standards at the nearby sensitive receiver locations.

Further, this analysis demonstrates that the Project will contribute a *less than significant* long-term operational noise level impact to the existing ambient noise environment at all of the nearby sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed Project activities, such as the roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity, are considered *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the closest point to the nearby receiver locations from edge of primary Project construction activity. Using sample reference noise levels to represent the construction activities of the KTM French Valley site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The results of the construction noise analysis show that the unmitigated construction noise levels will satisfy the City of Murrieta Municipal Code construction noise level standards of 75 dBA L_{max} for mobile equipment, and 60 dBA L_{max} for stationary equipment. Therefore, the construction of the Project will result in a *less than significant* noise impact.

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 186 to 264 feet from the location of primary construction activities, construction vibration velocity levels are expected to approach 0.003 in/sec (RMS) at the nearby receiver locations, and will remain below the County of Riverside and City of Murrieta vibration thresholds of 0.01 in/sec RMS. As such, the Project-related vibration impacts will be *less than significant* during the construction activities at the Project site.

Further, the vibration levels due to Project construction do not represent vibration levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (3) The peak Project-construction vibration levels, approaching 0.004 in/sec PPV, will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the levels at the site of the closest sensitive receivers 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.

CONSTRUCTION NOISE AND VIBRATION BEST PRACTICES

Though construction noise and vibration are temporary, intermittent, will be short in duration, and will not present any long-term impacts, the following best practices would further reduce noise and vibration levels produced by the construction equipment to the nearby sensitive land uses.

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May (County of Riverside Municipal Code, Section 9.52.020). The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.

- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).
- The construction contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

SUMMARY OF SIGNIFICANCE FINDINGS

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

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	*n/a*
On-Site Aircraft Noise	4	*Less Than Significant*	*n/a*
Operational Noise	9	*Less Than Significant*	*n/a*
Construction Noise	10	*Less Than Significant*	*n/a*
Construction Vibration		*Less Than Significant*	*n/a*

"n/a" = No mitigation is required since the unmitigated impact will be less than significant.

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1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed KTM French Valley site is located on the northeast corner of Winchester Road (SR-79) and Hunter Road unincorporated County of Riverside, as shown on Exhibit 1-A. The Project site is currently vacant. Nearby existing residential land uses are located west of the Project site across Winchester Road. The vacant land located north and south of the Project site is designated as commercial use. The French Valley Airport is located east of the Project site across Sky Canyon Drive at approximately 400 feet.

1.2 PROJECT DESCRIPTION

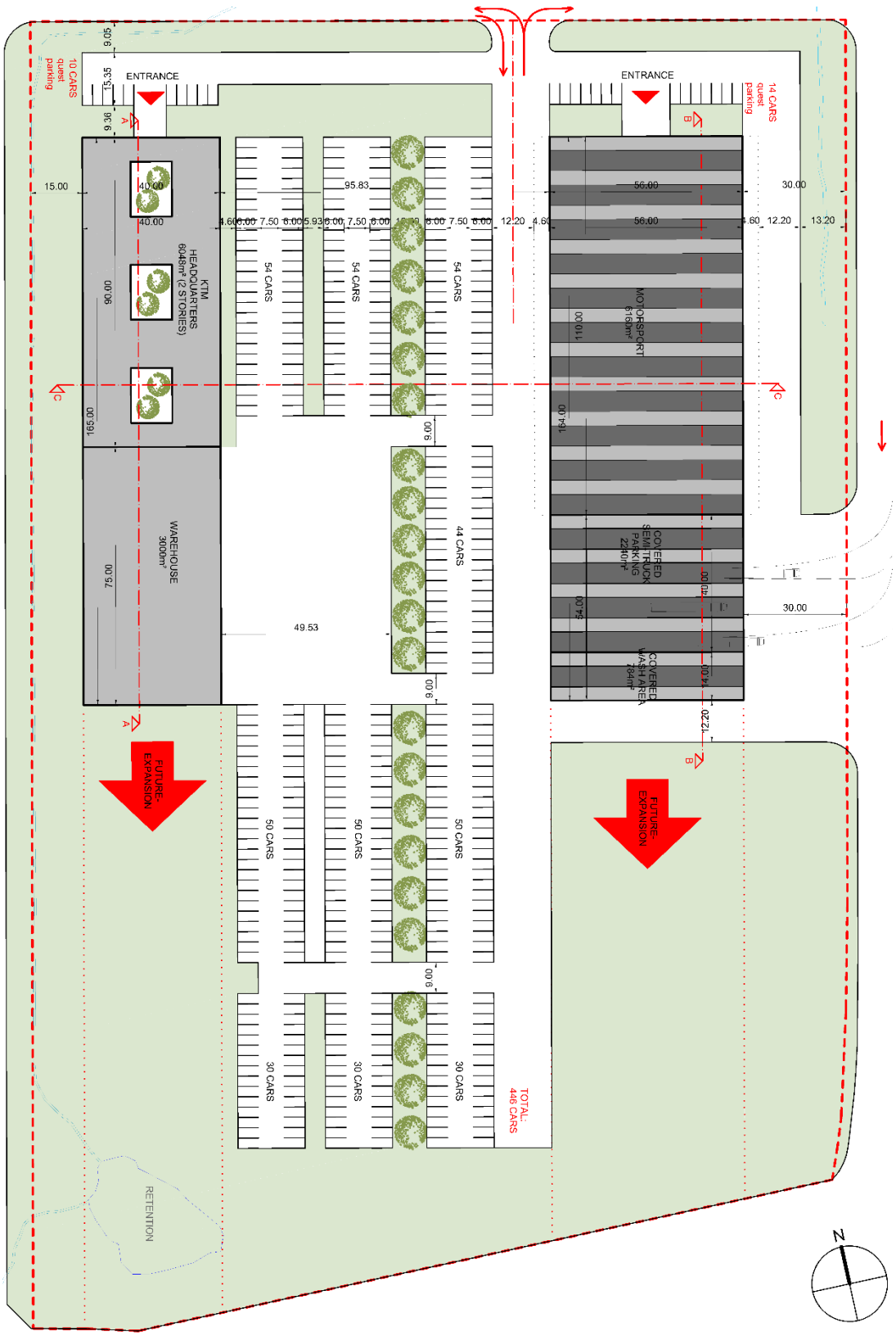
The Project is proposed to consist of the development of 32,292 square feet of warehouse use, 65,100 square feet of office use, and a 66,306 square foot research and development center, as shown on Exhibit 1-B.

The on-site stationary noise sources associated with the proposed KTM French Valley Project are expected to include roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity.

According to the *KTM French Valley Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 1,469 trip-ends per day (actual vehicles). The Project trip generation includes 11 truck trip-ends per day from the Project site. This noise study relies on the actual Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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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		

Source: 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 (EPA/ONAC 550/9-74-004) March 1974.

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. (4) 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. (5) 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 and is commonly used to describe the "average" noise levels within the environment.

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. (4)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor 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 receptor, 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 receptor 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. (6)

2.3.3 ATMOSPHERIC EFFECTS

Receptors 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. (4)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. 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 resident. 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. (6)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor 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 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 receptor. 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. (6)

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. (7)

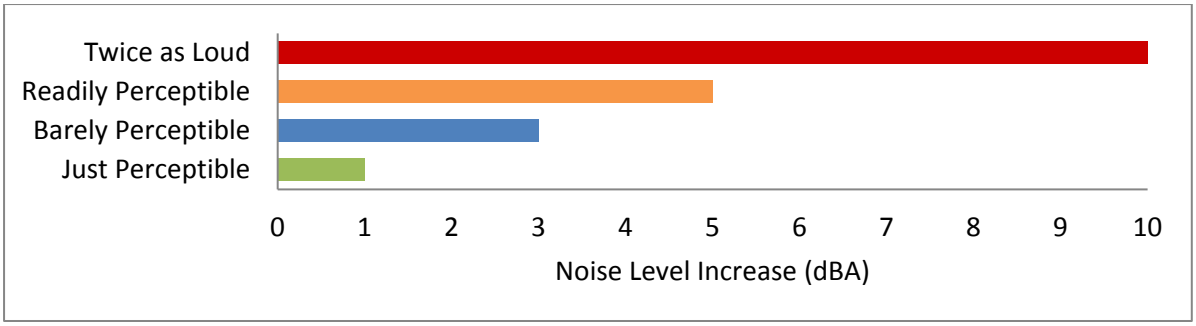
2.7 COMMUNITY RESPONSE TO NOISE

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. (8) 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. (8) 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. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (9)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (10)

2.9 VIBRATION

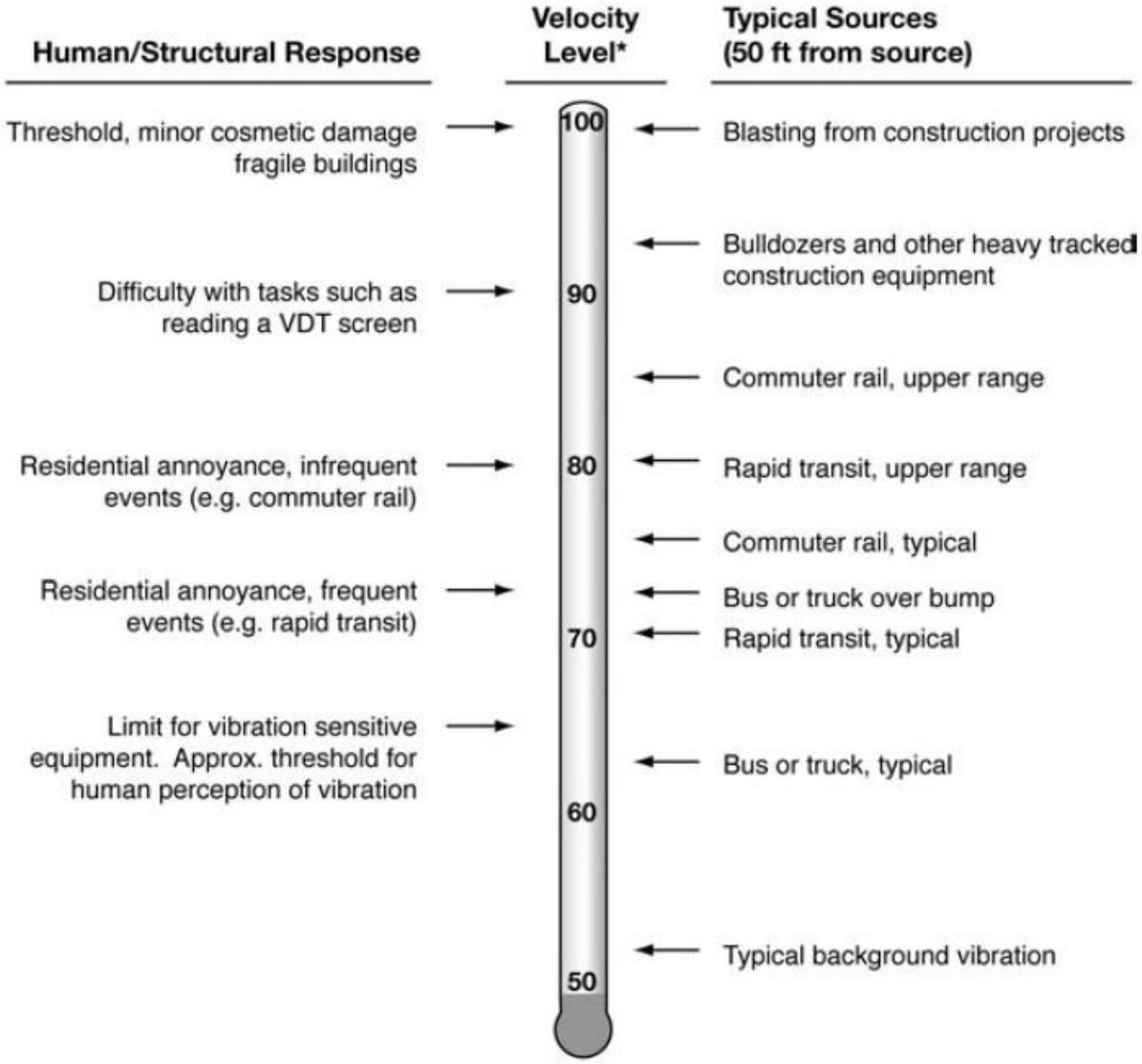
Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (3), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions.

As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings, but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal, and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

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3 REGULATORY SETTING

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

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (11) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2014 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (12) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

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. (13) 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 1.7 Require proposed land uses, affected by unacceptable high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

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.

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.

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

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

i. Temporary noise attenuation fences;

ii. Preferential location and equipment; and

iii. Use of current noise suppression technology and equipment.

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

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 65 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 noise levels higher than 65 CNEL. The intent of policy N 1.7 is to require a noise analysis for land uses impacted by unacceptably high noise levels and include mitigation measures in the design. Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit 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. To prevent high levels of construction noise from impacting noise-sensitive land uses, policies N 13.1 through 13.3 identify construction noise mitigation requirements for new development located near existing noise-sensitive land uses. Policy 16.3 establishes the vibration perception threshold for rail-related vibration levels, used in this analysis as a threshold for determining potential vibration impacts due to Project construction. (13)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the County of Riverside Noise Element (Table N-1) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the County with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The *Land Use Compatibility for Community Noise Exposure* matrix describes categories of compatibility and not specific noise standards. Office and other non-noise sensitive land uses (e.g., commercial, industrial), such as the KTM French Valley Project, are considered *normally acceptable* with unmitigated exterior noise levels of less than 70 dBA CNEL. For *conditionally acceptable* exterior noise levels, approaching 75 dBA CNEL for Project land uses, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice*. (13)

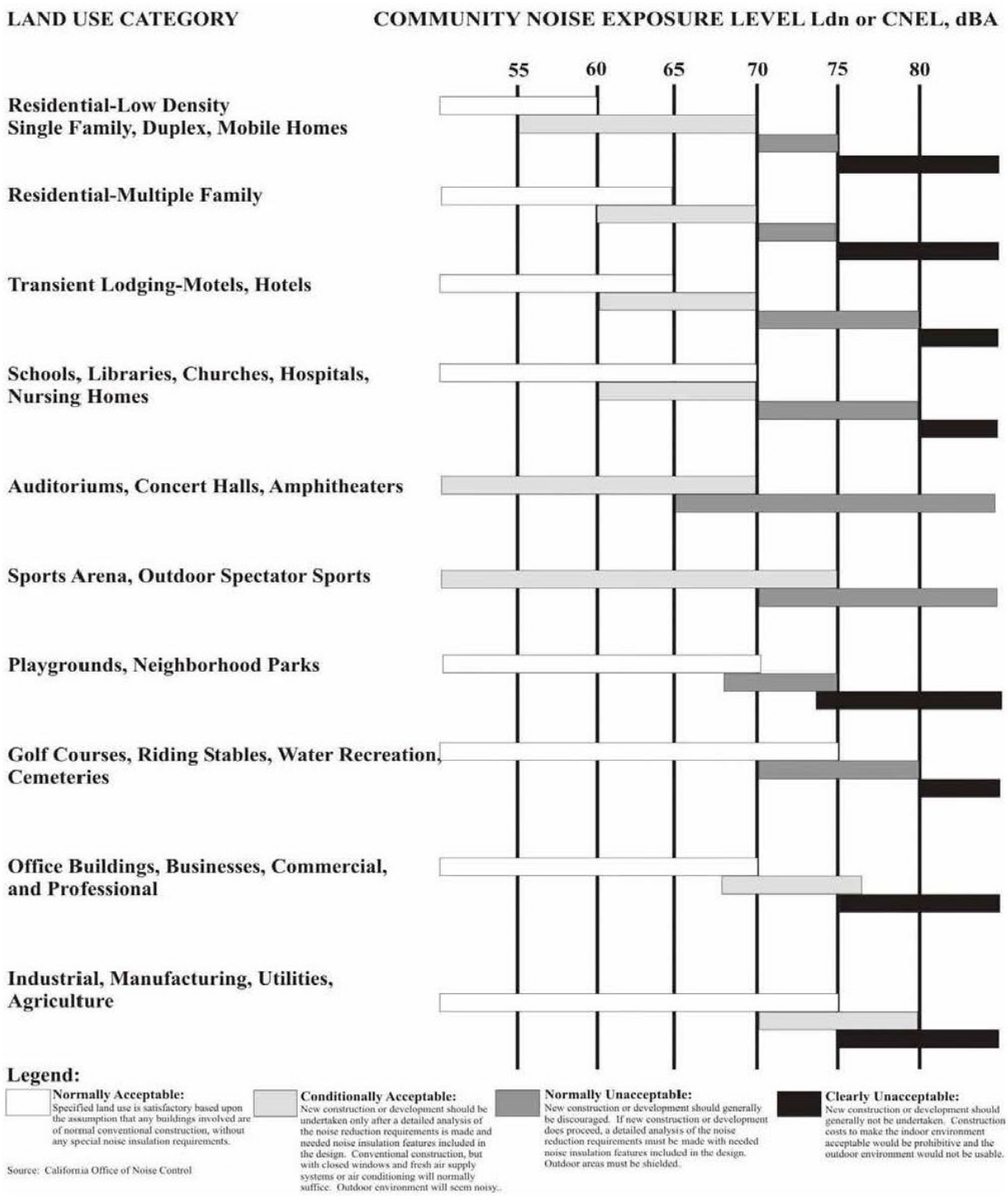
3.3.2 COUNTY OF RIVERSIDE STATIONARY NOISE STANDARDS

The County of Riverside has set exterior noise limits to control roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity associated with the development of the proposed KTM French Valley. The County considers noise generated using motor vehicles to be a stationary noise source when operated on private property such as at a loading dock or tire and lube center. These facility-related noises, as projected to any portion of any surrounding property containing a *habitable dwelling, hospital, school, library or nursing home*, must not exceed the following worst-case noise levels.

Policy N 4.1 of the Noise Element sets an exterior noise limit 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. (14)

The County of Riverside operational noise standards used in this analysis are shown on Table 3-1.

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE



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

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the KTM French Valley Project, stationary-source (operational) noise such as roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity are typically evaluated against standards established under the Municipal Code.

3.4.1 COUNTY OF RIVERSIDE OPERATIONAL NOISE STANDARDS

Although the Project site is located within the County of Riverside, several sensitive receivers are in the adjacent City of Murrieta. Therefore, this analysis presents both the County of Riverside General Plan stationary noise standards, previously described in Section 3.3, and City of Murrieta Municipal Code operational noise standards discussed below. The stationary-source noise level standards, shown on Table 3-1, are consistent with the County of Riverside Office of Industrial Hygiene guidelines for noise studies within the County. (15)

3.4.2 CITY OF MURRIETA OPERATIONAL NOISE STANDARDS

Section 16.30.090 of the City of Murrieta Municipal Code states the following: *No person shall, operate or cause to be operated, any source of sound at any location within the City or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by a person that causes the noise level, when measured on any other property, to exceed*…the maximum permissible sound levels by receiving land use as shown on Table 3-1. For noise-sensitive residential properties (Noise Zone II), the Municipal Code identifies operational noise level limits for the daytime (7:00 a.m. to 10:00 p.m.) hours of 50 dBA L_{50} and 45 dBA L_{50} during the nighttime (10:00 p.m. to 7:00 a.m.) hours. These standards shall apply for a cumulative period of 30 minutes in any hour, as well as plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. (16)

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Exterior Noise Level Standards (dBA)[3]					
			L_{eq} (Average)	L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
County of Riverside[1]	Residential	Daytime	65	-	-	-	-	-
		Nighttime	45	-	-	-	-	-
City of Murrieta[2]	Residential (Noise Zone II)	Daytime	-	50	55	60	65	70
		Nighttime	-	45	50	55	60	65

[1] Source: County of Riverside General Plan Noise Element, Table N-2.
[2] Source: City of Murrieta Municipal Code, Section 16.30.090 (A) & (B) (Appendix 3.1).
[3] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{25} is the noise level exceeded 25% of the time. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the KTM French Valley Project, noise from construction activities are typically limited to the hours of operation established under the Municipal Code. The Municipal Code noise standards for construction are described below for the County of Riverside and the City of Murrieta to determine the potential noise impacts at receiver locations within each jurisdiction. The construction-related noise standards are summarized in Tables 3-2 and 3-3.

3.5.1 COUNTY OF RIVERSIDE 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 9.52.020 of the County's Noise Regulation ordinance 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. (17) Neither the County's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, the noise levels due to Project construction are evaluated based on the City of Murrieta construction noise standards at the nearby sensitive land uses.

3.5.2 CITY OF MURRIETA CONSTRUCTION NOISE STANDARDS

The City of Murrieta has established maximum noise levels for mobile and stationary equipment. Section 16.30.130 of the Municipal Code identifies limits on noise from construction activities to the noise levels shown on Table 3-2 and 3-3 for mobile and stationary equipment, respectively. The nearest noise-sensitive receivers to the Project site consist of existing single-family residential developments. For single-family residential development, mobile equipment noise levels may not exceed 75 dBA L_{max} and stationary equipment noise levels may not exceed 60 dBA L_{max} during the daytime hours. (16) The City of Murrieta Municipal Code noise standards are included in Appendix 3.1.

TABLE 3-2: MOBILE EQUIPMENT NOISE LEVEL LIMITS

Receiving Land Use Category	Time Period	Maximum Noise Levels (dBA L_{max})[1]
Single-Family Residential	Daytime (7:00 a.m. - 8:00 p.m.)	75
	Nighttime (8:00 p.m. - 7:00 a.m.)	60
Multi-Family Residential	Daytime (7:00 a.m. - 8:00 p.m.)	80
	Nighttime (8:00 p.m. - 7:00 a.m.)	64
Commercial	Daytime (7:00 a.m. - 8:00 p.m.)	85
	Nighttime (8:00 p.m. - 7:00 a.m.)	70

[1] Maximum noise levels for mobile equipment, City of Murrieta Municipal Code, 16.30.130 (A) (Appendix 3.1).

TABLE 3-3: STATIONARY EQUIPMENT NOISE LEVEL LIMITS

Receiving Land Use Category	Time Period	Maximum Noise Levels (dBA L_{max})[1]
Single-Family Residential	Daytime (7:00 a.m. - 8:00 p.m.)	60
	Nighttime (8:00 p.m. - 7:00 a.m.)	50
Multi-Family Residential	Daytime (7:00 a.m. - 8:00 p.m.)	65
	Nighttime (8:00 p.m. - 7:00 a.m.)	55
Commercial	Daytime (7:00 a.m. - 8:00 p.m.)	70
	Nighttime (8:00 p.m. - 7:00 a.m.)	60

[1] Maximum noise levels for stationary equipment, City of Murrieta Municipal Code, 16.30.130 (A) (Appendix 3.1).

3.6 CONSTRUCTION VIBRATION STANDARDS

To analyze the vibration impacts originating from the construction of the Project, vibration from construction activities are typically evaluated against standards established under the Municipal Code. The Municipal Code vibration standards for construction are described below for the County of Riverside and City of Murrieta to determine the potential vibration impacts at receivers

within each jurisdiction. The construction-related vibration standards for each jurisdiction are summarized in Table 3-4.

3.6.1 COUNTY OF RIVERSIDE CONSTRUCTION VIBRATION STANDARDS

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 0.787 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. (13) However, since the nearest sensitive receiver locations are located within the City of Murrieta, the City of Murrieta vibration standards are used to evaluate the potential impacts at nearby sensitive receiver locations.

3.6.2 CITY OF MURRIETA CONSTRUCTION VIBRATION STANDARDS

The City of Murrieta Municipal Code, Section 16.30.130 (K), states that *operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet from the source if on public space or public right-of-way* is prohibited. The Municipal Code defines the vibration perception threshold to be a motion velocity of 0.01 in/sec over the range of one to 100 Hz. (16)

3.6.3 HUMAN PERCEPTION OF VIBRATION

Typically, the human response at the perception threshold for vibration includes annoyance in residential areas as previously shown on Exhibit 2-B, when vibration levels expressed in vibration decibels (VdB) approach 75 VdB. The City of Murrieta, however, identifies a vibration perception threshold of 0.01 in/sec. For vibration levels expressed in velocity, the human body responds to the average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human response to vibration. Therefore, the City of Murrieta vibration standard of 0.01 in/sec in RMS velocity levels is used in this analysis to assess the human perception of vibration levels due to Project-related construction activities.

TABLE 3-4: CONSTRUCTION VIBRATION STANDARDS

Jurisdiction	Root-Mean-Square Velocity Standard (in/sec)
County of Riverside[1]	0.01
City of Murrieta[2]	0.01

[1] Source: County of Riverside General Plan Noise Element, Policy N 16.3.
[2] Source: City of Murrieta Municipal Code, Section 16.30.130 (K) (Appendix 3.1).

3.7 RIVERSIDE COUNTY AIRPORT LAND USE COMPATIBILITY PLAN

The Riverside County Airport Land Use Compatibility Plan (RC ALUCP) establishes compatibility criteria for land uses in relation to the noise contour boundaries of airports within the County of Riverside. Chapter 2, *Countywide Policies*, of the RC ALUCP establishes Policy 4.1.6 which identifies an interior noise level limit of 45 dBA CNEL with windows closed for office buildings affected by aircraft-related noise. In addition, the RC ALUCP provides Table 2B *Supporting Compatibility Criteria: Noise*, which indicates that office uses such as the Project, are considered *clearly acceptable* when located within the 50 to 55 dBA CNEL noise contour boundaries of an airport. Office uses are considered *normally acceptable* when located within the 55 to 60 dBA CNEL noise contours of an airport. Office uses that are located between the 60 to 65 dBA CNEL noise contours are considered *marginally acceptable* and the *indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.* (18)

The French Valley Airport is located roughly 400 feet east of the Project site. Map FV-3 of the RC ALUCP shows the French Valley Airport Noise Compatibility Contours. The Project site is partially located within the 55 to 60 dBA CNEL and 60 to 65 dBA CNEL noise contour boundaries of the French Valley Airport, as shown on Exhibit 3-B.

Exhibit 3-B shows the office uses within the Project site are considered *normally acceptable* since they are located between the 55 and 60 dBA CNEL noise contour boundaries of the French Valley Airport. The outdoor covered truck parking and car wash areas are located within the 60 to 65 dBA CNEL noise contours, shown on Exhibit 3-B, and therefore, are considered *marginally acceptable*. The outdoor activities at the Project site will be minimal, with most activity occurring within the proposed office uses at the Project site.

EXHIBIT 3-B: FRENCH VALLEY AIRPORT NOISE LEVEL CONTOUR BOUNDARIES

Source: Riverside County Airport Land Use Compatibility Plan, Map FV-3.

4 SIGNIFICANCE CRITERIA

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

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

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

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

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

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

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

While the CEQA Guidelines and the 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 under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility.

As previously shown on Exhibit 3-B, the office uses within the Project site are considered *normally acceptable* since they are located between the 55 and 60 dBA CNEL noise contour boundaries of the French Valley Airport. The outdoor covered truck parking and car wash areas are located within the 60 to 65 dBA CNEL noise contours, shown on Exhibit 3-B, and therefore, are considered *marginally acceptable*. However, the outdoor activities at the Project site will be minimal, with most activity occurring within the proposed office uses at the Project site. Therefore, while some aircraft noise levels will be heard, the noise due to aircraft flyovers represents a *less than significant* noise level impact at the Project site.

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.* (19)

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) (20) 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 (i.e., CNEL).

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, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per 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. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

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*. (13)

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 s 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. Table 4.2 provides a summary of the noise impact significance criteria.

4.3 SIGNIFICANCE CRITERIA

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):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact 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; 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 50 dBA L_{50} daytime or 45 dBA L_{50} nighttime noise level standards at nearby sensitive residential land uses in the City of Murrieta. These standards shall not be exceeded for a cumulative period of 30 minutes (L_{50}) or cannot exceed 55 dBA (daytime) or 50 dBA (nighttime) for a cumulative period of more than 15 minutes (L_{25}) in any hour, or 60 dBA (daytime) or 55 dBA (nighttime) for a cumulative period of more than 5 minutes (L8) in any hour, or 65 dBA (daytime) or 60 dBA (nighttime) for a cumulative period of more than 1 minute (L2) in any hour, or 70 dBA (daytime) or 65 dBA (nighttime) at any time (Lmax) (City of Murrieta Municipal Code, Sections 16.30.090 (A) & (B)).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{50} and the Project creates a readily perceptible 5 dBA L_{50} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{50} and the Project creates a barely perceptible dBA L_{50} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{50}, and the Project creates a community noise level impact of greater than 1.5 dBA L_{50} (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities create noise levels which exceed the mobile 75 dBA L_{max} or stationary 60 dBA L_{max} equipment noise level limits at the nearby sensitive residential land uses (City of Murrieta Municipal Code, Section 16.30.130 (A)).
- If short-term Project generated construction vibration levels could exceed the City of Murrieta maximum acceptable vibration standard of 0.01 in/sec (RMS) at sensitive receiver locations (City of Murrieta Municipal Code, Section 16.30.130 (K)).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic Noise	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational Noise	Noise-Sensitive	Exterior Noise Level Standards[3]	See Table 3-1	
		if ambient is < 60 dBA L_{50}[1]	≥ 5 dBA L_{50} Project increase	
		if ambient is 60 - 65 dBA L_{50}[1]	≥ 3 dBA L_{50} Project increase	
		if ambient is > 65 dBA L_{50}[1]	≥ 1.5 dBA L_{50} Project increase	
Construction Noise & Vibration	Noise-Sensitive	Mobile Equipment Noise Level Threshold[4]	75 dBA L_{max}	
		Stationary Equipment Noise Level Threshold[4]	60 dBA L_{max}	
		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] Sources: County of Riverside General Plan Noise Element, Table N-2 and the City of Murrieta Municipal Code, Section 16.30.090 (A) & (B).
[4] Source: City of Murrieta Municipal Code, 16.30.130 (A) (Appendix 3.1)
[5] Source: City of Murrieta Municipal Code, Section 16.30.130 (K) (Appendix 3.1).
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, six 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 11th, 2018. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (21)

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 any 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*. (4) 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*. (3)

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. (3) 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. Median noise levels (L_{50}) are also provided on Table 5-1 consistent with the City of Murrieta Municipal Code standards previously shown on Table 3-1. 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 Sparkman Way adjacent to a French Valley Airport parking lot and vacant land. The noise level measurements collected show an overall 24-hour exterior noise level of 61.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 57.2 dBA L_{eq} with an average nighttime noise level of 53.6 dBA L_{eq}.
- Location L2 represents the noise levels north of the Project site on Winchester Road adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 80.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 74.3 dBA L_{eq} with an average nighttime noise level of 73.2 dBA L_{eq}.
- Location L3 represents the noise levels west of the Project site across Winchester Road adjacent to existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 78.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 72.8 dBA L_{eq} with an average nighttime noise level of 71.5 dBA L_{eq}.
- Location L4 represents the noise levels west of the Project site across Winchester Road adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 74.9 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 69.9 dBA L_{eq} with an average nighttime noise level of 67.7 dBA L_{eq}.
- Location L5 represents the noise levels southwest of the Project site on Augusta Drive adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 64.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 60.2 dBA L_{eq} with an average nighttime noise level of 57.6 dBA L_{eq}.
- Location L6 represents the noise levels south of the Project site adjacent to a vacant lot designated as future commercial land use. The 24-hour CNEL indicates that the overall exterior noise level is 57.3 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 56.9 dBA L_{eq} with an average nighttime noise level of 47.0 dBA L_{eq}.

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

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. This includes the auto and heavy truck activities on study area roadway segments such as Winchester Road (SR-79) near the noise level measurement locations. Background noise sources also include aircraft flyover noise levels from French Valley Airport east of the Project site. 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]	Jurisdiction	Distance to Site (Feet)	Description	Energy Average Noise Level (dBA L_{eq})[2]		Average Median Noise Level (dBA L_{50})[2]		CNEL
				Daytime	Nighttime	Daytime	Nighttime	
L1	County of Riverside	1,635'	Located north of the Project site on Sparkman Way adjacent to a French Valley Airport parking lot and vacant land.	57.2	53.6	50.9	46.3	61.0
L2	Murrieta	1,230'	Located north of the Project site on Winchester Road adjacent to existing residential homes.	74.3	73.2	72.3	66.2	80.0
L3	Murrieta	150'	Located west of the Project site across Winchester Road adjacent to existing residential homes.	72.8	71.5	71.3	63.9	78.4
L4	Murrieta	133'	Located west of the Project site across Winchester Road adjacent to existing residential homes.	69.9	67.7	67.2	60.0	74.9
L5	Murrieta	950'	Located southwest of the Project site on Augusta Drive adjacent to existing residential homes.	60.2	57.6	58.7	53.7	64.8
L6	County of Riverside	285'	Located south of the Project site adjacent to a vacant lot designated as future commercial land use.	56.9	47.0	44.9	39.3	57.3

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (22) 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. (23) 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.

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 10 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications according to 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 were obtained from the *KTM French Valley Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Existing plus Ambient (EA) 2020, and EA plus Cumulative (EAC) 2020 conditions. (2) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.

For this analysis, soft site conditions are used to analyze the traffic noise level increases with the Project on the study area roadway segments. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Consistent with Appendix EIR-7 of the *County of Riverside General Plan Amendment No. 960 Environmental Impact Report*, the off-site traffic noise analysis provided in this Noise Study is intended to document the traffic noise environment and project future potential traffic noise level increases due to the KTM French Valley Project. (24) As such, the off-site traffic noise analysis does not follow the County of Riverside Office of Industrial Hygiene hard site condition requirements for determining and mitigating on-site traffic noise impacts at residential structures, consistent with the *County of Riverside General Plan Amendment No. 960 Environmental Impact Report*. (24) Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this noise study. (25)

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Land Use[1]	Distance From Centerline To Nearest Adjacent Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	92'	55
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	92'	55
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	92'	55
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	92'	55
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	92'	55
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	92'	55
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	50'	40
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	30'	40
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	30'	40
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	37'	45

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the County of Riverside and City of Murrieta General Plan Circulation Elements.
[3] Source: KTM French Valley Traffic Impact Analysis, August 2018.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]					
			Existing		EA 2020		EAC 2020	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Winchester Rd. (SR-79)	n/o Auld Rd.	45,936	46,521	47,792	48,377	63,678	64,263
2	Winchester Rd. (SR-79)	s/o Auld Rd.	49,249	49,834	51,239	51,824	60,092	60,677
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	52,549	53,214	54,672	55,337	67,494	68,159
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	58,712	59,523	61,084	61,895	73,356	74,167
5	Winchester Rd. (SR-79)	s/o Technology Dr.	56,612	57,350	58,899	59,637	70,151	70,889
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	49,372	49,666	51,367	51,661	56,277	56,571
7	Auld Rd.	e/o Winchester Rd. (SR-79)	7,881	7,954	8,199	8,272	17,144	17,217
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	1,186	1,853	1,234	1,901	5,952	6,619
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	3,381	3,454	3,518	3,591	4,206	4,279
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	40,209	40,652	41,834	42,277	48,220	48,663

[1] Source: KTM French Valley Traffic Impact Analysis, August 2018.
"EA" = Existing plus Ambient Growth; "EAC" = Existing plus Ambient Growth plus Cumulative Developments

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	71.55%	12.98%	15.47%	100.00%
Medium Trucks	70.41%	5.61%	23.98%	100.00%
Heavy Trucks	77.80%	5.86%	16.34%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 5/24/2018 on Winchester Road south of Sparkman Way (KTM French Valley Traffic Impact Analysis, August 2018). All values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *KTM French Valley Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 1,469 trip-ends per day (actual vehicles). The Project trip generation includes 11 truck trip-ends per day from the Project site. This noise study relies on the actual Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

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

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

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

Classification	Total Daily % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	98.56%	0.37%	1.07%	100.00%

[1] Based on existing ADT counts by vehicle type taken on 5/24/2018 on Winchester Road south of Sparkman Way (KTM French Valley Traffic Impact Analysis, August 2018). All values rounded to the nearest one-hundredth.

TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Winchester Rd. (SR-79)	n/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
2	Winchester Rd. (SR-79)	s/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	98.56%	0.37%	1.07%	100.00%
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	98.56%	0.37%	1.07%	100.00%
5	Winchester Rd. (SR-79)	s/o Technology Dr.	98.56%	0.37%	1.07%	100.00%
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	98.56%	0.37%	1.07%	100.00%
7	Auld Rd.	e/o Winchester Rd. (SR-79)	98.57%	0.37%	1.06%	100.00%
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	98.48%	0.35%	1.17%	100.00%
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	98.59%	0.37%	1.05%	100.00%
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	98.56%	0.37%	1.07%	100.00%

[1] Source: KTM French Valley Traffic Impact Analysis, August 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: EA 2020 WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Winchester Rd. (SR-79)	n/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
2	Winchester Rd. (SR-79)	s/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	98.56%	0.37%	1.07%	100.00%
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	98.56%	0.37%	1.07%	100.00%
5	Winchester Rd. (SR-79)	s/o Technology Dr.	98.56%	0.37%	1.07%	100.00%
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	98.56%	0.37%	1.07%	100.00%
7	Auld Rd.	e/o Winchester Rd. (SR-79)	98.57%	0.37%	1.06%	100.00%
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	98.48%	0.35%	1.17%	100.00%
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	98.59%	0.37%	1.05%	100.00%
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	98.56%	0.37%	1.07%	100.00%

[1] Source: KTM French Valley Traffic Impact Analysis, August 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: EAC 2020 WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Winchester Rd. (SR-79)	n/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
2	Winchester Rd. (SR-79)	s/o Auld Rd.	98.57%	0.37%	1.06%	100.00%
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	98.56%	0.37%	1.07%	100.00%
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	98.56%	0.37%	1.07%	100.00%
5	Winchester Rd. (SR-79)	s/o Technology Dr.	98.56%	0.37%	1.07%	100.00%
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	98.56%	0.37%	1.07%	100.00%
7	Auld Rd.	e/o Winchester Rd. (SR-79)	98.56%	0.37%	1.07%	100.00%
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	98.54%	0.37%	1.10%	100.00%
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	98.58%	0.37%	1.05%	100.00%
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	98.56%	0.37%	1.07%	100.00%

[1] Source: KTM French Valley Traffic Impact Analysis, August 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

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

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-8. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 6-8: 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, May 2006.

7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *KTM French Valley Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- Existing Without / With Project: This scenario refers to the existing present-day noise conditions, without and with the proposed Project.
- Existing plus Ambient Growth (EA) 2020 Without / With Project: This scenario refers to Year 2020 noise conditions without and with the proposed Project plus ambient growth.
- EA plus Cumulative Development (EAC) 2020 Without / With Project: This scenario refers to Year 2020 noise conditions without and with the proposed Project plus ambient growth, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not take into account the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 10 study area roadway segments analyzed from the without Project to the with Project conditions in each of the four timeframes: Existing, Existing plus Ambient Growth (EA) 2020, and EA plus Cumulative Development (EAC) 2020 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the six traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	72.8	141	304	655
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	73.1	148	319	687
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	73.4	154	333	717
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	73.9	166	358	772
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	73.7	162	350	753
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.1	148	319	688
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	65.5	RW	54	117
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	60.3	RW	RW	31
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	64.8	RW	RW	63
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	75.4	85	183	394

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	72.8	142	306	660
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	73.1	149	321	691
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	73.4	156	336	723
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	73.9	168	361	779
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	73.8	164	353	760
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.1	149	320	690
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	65.6	RW	54	117
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	62.3	RW	RW	43
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	64.9	RW	RW	63
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	75.5	85	184	397

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: EA 2020 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	73.0	145	312	673
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	73.3	152	327	705
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	73.5	159	342	736
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	74.0	171	368	793
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	73.9	167	359	774
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.3	152	328	706
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	65.7	RW	56	120
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	60.4	RW	RW	32
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	65.0	RW	30	65
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	75.6	87	188	405

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: EA 2020 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	73.0	146	314	677
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	73.3	153	329	709
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	73.6	160	344	742
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	74.1	172	371	799
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	73.9	168	362	780
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.3	153	329	709
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	65.7	RW	56	120
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	62.4	RW	RW	44
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	65.0	RW	30	65
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	75.6	88	189	407

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: EAC 2020 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	74.2	176	378	815
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	74.0	169	364	784
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	74.5	183	393	847
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	74.8	193	416	895
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	74.6	187	403	869
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.7	162	348	750
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	68.9	RW	91	196
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	67.3	RW	43	92
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	65.8	RW	34	73
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	76.2	96	206	445

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: EAC 2020 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Nearest Adjacent Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Winchester Rd. (SR-79)	n/o Auld Rd.	Residential	74.2	176	380	819
2	Winchester Rd. (SR-79)	s/o Auld Rd.	Residential	74.0	170	366	788
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	Residential	74.5	184	396	853
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	Residential	74.9	194	419	902
5	Winchester Rd. (SR-79)	s/o Technology Dr.	Residential	74.7	189	406	875
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	Commercial	73.7	162	349	753
7	Auld Rd.	e/o Winchester Rd. (SR-79)	Commercial	68.9	RW	91	196
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	Commercial	67.8	RW	46	99
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	Residential	65.8	RW	34	73
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	Residential	76.2	96	208	447

[1] Sources: County of Riverside General Plan, Southwest Area Land Use Plan and the City of Murrieta General Plan Land Use Policy Map.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 60.3 to 75.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 625.3 to 75.5 dBA CNEL. As shown on Table 7-7 the Project will generate a noise level increase of up to 2.0 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Existing conditions at the land uses adjacent to roadways conveying Project traffic.

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

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Winchester Rd. (SR-79)	n/o Auld Rd.	72.8	72.8	0.0	Yes	No
2	Winchester Rd. (SR-79)	s/o Auld Rd.	73.1	73.1	0.0	Yes	No
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	73.4	73.4	0.1	Yes	No
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	73.9	73.9	0.1	Yes	No
5	Winchester Rd. (SR-79)	s/o Technology Dr.	73.7	73.8	0.1	Yes	No
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	73.1	73.1	0.0	No	No
7	Auld Rd.	e/o Winchester Rd. (SR-79)	65.5	65.6	0.0	No	No
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	60.3	62.3	2.0	No	No
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	64.8	64.9	0.1	Yes	No
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	75.4	75.5	0.0	Yes	No

[1]The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4).

7.3 EXISTING PLUS AMBIENT GROWTH PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the Existing plus Ambient Growth (EA) 2020 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 60.4 to 75.6 dBA CNEL without the Project. Table 7-4 presents the EA 2020 with Project conditions noise level contours that are expected to range from 62.4 to 75.6 dBA CNEL. As shown on Table 7-8 the Project will generate *less than significant* noise level increases of up to 2.0 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related increases represent a *less than significant* impact under EA 2020 conditions.

TABLE 7-8: EA 2020 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Winchester Rd. (SR-79)	n/o Auld Rd.	73.0	73.0	0.0	Yes	No
2	Winchester Rd. (SR-79)	s/o Auld Rd.	73.3	73.3	0.0	Yes	No
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	73.5	73.6	0.1	Yes	No
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	74.0	74.1	0.1	Yes	No
5	Winchester Rd. (SR-79)	s/o Technology Dr.	73.9	73.9	0.1	Yes	No
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	73.3	73.3	0.0	No	No
7	Auld Rd.	e/o Winchester Rd. (SR-79)	65.7	65.7	0.0	No	No
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	60.4	62.4	2.0	No	No
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	65.0	65.0	0.1	Yes	No
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	75.6	75.6	0.0	Yes	No

[1]The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4).

7.4 EA PLUS CUMULATIVE DEVELOPMENT PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-9 presents a comparison of the EA plus Cumulative Development (EAC) 2020 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 65.8 to 76.2 dBA CNEL without the Project. Table 7-6 presents the EAC 2020 with Project conditions noise level contours that are expected to range from 65.8 to 76.2 dBA CNEL. As shown on Table 7-9 the Project will generate *less than significant* noise level increases of up to 0.5 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related increases represent a *less than significant* impact under EAC 2020 conditions.

TABLE 7-9: EAC 2020 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)[1]			Noise-Sensitive Land Use?	Threshold Exceeded?[2]
			No Project	With Project	Project Addition		
1	Winchester Rd. (SR-79)	n/o Auld Rd.	74.2	74.2	0.0	Yes	No
2	Winchester Rd. (SR-79)	s/o Auld Rd.	74.0	74.0	0.0	Yes	No
3	Winchester Rd. (SR-79)	s/o Sparkman Wy.	74.5	74.5	0.0	Yes	No
4	Winchester Rd. (SR-79)	s/o Hunter Rd.	74.8	74.9	0.0	Yes	No
5	Winchester Rd. (SR-79)	s/o Technology Dr.	74.6	74.7	0.0	Yes	No
6	Winchester Rd. (SR-79)	s/o Murrieta Hot Springs Rd.	73.7	73.7	0.0	No	No
7	Auld Rd.	e/o Winchester Rd. (SR-79)	68.9	68.9	0.0	No	No
8	Sparkman Wy.	e/o Winchester Rd. (SR-79)	67.3	67.8	0.5	No	No
9	Robert Trent Jones Pkwy.	w/o Winchester Rd. (SR-79)	65.8	65.8	0.0	Yes	No
10	Murrieta Hot Springs Rd.	w/o Winchester Rd. (SR-79)	76.2	76.2	0.0	Yes	No

[1]The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
[2] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following four 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, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

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

R1: Located approximately 169 feet west of the Project site across Winchester Road, R1 represents existing single-family residential homes. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R2: Location R2 represents the existing residential homes located roughly 179 feet west of the Project site across Winchester Road. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R3: Location R3 represents the existing residential homes situated west of the Project site at approximately 185 feet across Winchester Road adjacent to an existing commercial shopping center. A long-term noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R4: Location R4 represents the existing residential home situated approximately 248 feet southwest of the Project site on the southwest corner of Winchester Road and Hunter Road. A long-term noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS

9 OPERATIONAL NOISE IMPACTS

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

9.1 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 associated with roof-top air conditioning units, pressure washing activity, parking lot vehicle movements, motorcycle safety course activity, idling trucks, backup alarms, as well as trailer movement and storage activity.

9.1.1 ROOF-TOP AIR CONDITIONING UNITS

In order to assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. Using a uniform reference distance of 50 feet, the noise level is 54.4 dBA L_{50}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours, for a total of 39 minutes per hour, and are anticipated to operate during the daytime and nighttime hours at the Project site. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

9.1.2 PRESSURE WASHER ACTIVITY

To describe pressure washers at the Project site car wash area, a reference noise level measurement was collected at the Audi Mission Viejo dealership on June 10th, 2016. The reference pressure washer activity noise level was measured at 68.2 dBA L_{50} at a uniform reference distance of 50 feet. It is expected that pressure washers would be located in the outdoor car wash area within the Project site. Pressure washer activities are expected to occur for 30 minutes during peak hour conditions.

9.1.3 PARKING LOT VEHICLE MOVEMENTS

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 38.5 dBA L_{50}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak activity and employees talking. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

9.1.4 MOTORCYCLE SAFETY COURSE ACTIVITY

To evaluate the noise levels associated with the motorcycle training course within the Project site, Urban Crossroads collected a reference noise level measurement at the Ride Rite motorcycle training course in the Crossroads Church parking lot located at 2331 Kellogg Avenue in the City of Corona. The reference noise level at 50 feet from activity was measured at 55.6 dBA L_{50}. The reference noise level measurement includes up to seven motorcycles driving around the safety course simultaneously, with two instructors yelling directions to the course attendees. Background noise sources include parking lot vehicle movements associated with the Crossroads Church parking lot. Noise associated with motorcycle safety course activity is expected to operate for the entire hour (60 minutes).

9.1.5 TRUCK IDLING, BACKUP ALARMS, TRAILER MOVEMENTS & STORAGE

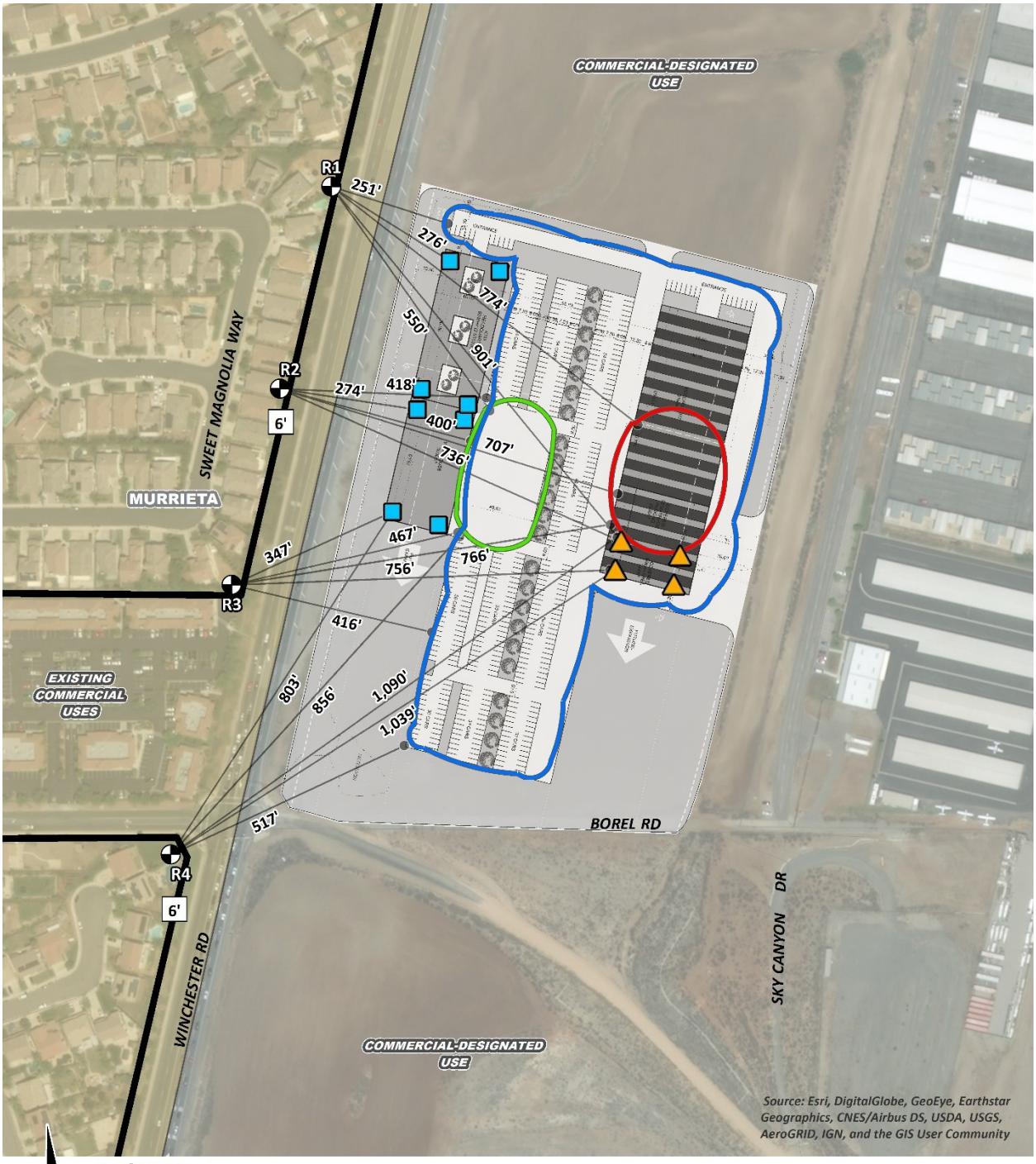
To evaluate the noise levels associated with truck idling, backup alarms, trailer movements and storage activities, Urban Crossroads collected a reference noise level measurement at an existing parcel hub facility, located in the City of Rialto on March 13th, 2017 to describe the potential operational noise levels associated with Project operational activities. The measured reference noise level at 50 feet from activity was measured at 54.9 dBA L_{50}. The reference noise level measurement includes a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, and backup alarm events. Noise associated with trailer movements and storage activity is expected to operate for the entire hour (60 minutes).

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins)[1]	Reference Noise Level (dBA L_{50})	
					@ Ref. Dist.	@ 50 Feet
Roof-Top Air Conditioning Units[2]	96:00:00	5'	5'	39	74.4	54.4
Pressure Washer Activity[3]	00:00:45	10'	5'	30	82.2	68.2
Parking Lot Vehicle Movements[4]	01:00:00	10'	5'	60	49.0	38.5
Motorcycle Safety Course Activity[5]	00:01:00	140'	5'	60	48.9	55.6
Truck Trailer Movements & Storage Activity[6]	00:00:36	50'	8'	60	54.9	54.9

[1] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.
[2] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[3] As measured by Urban Crossroads, Inc. at the Audi Mission Viejo dealership on 6/10/2016.
[4] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[5] As measured by Urban Crossroads, Inc. on 7/21/2018 at the Ride Rite motorcycle training course in the City of Corona.
[6] As measured by Urban Crossroads, Inc. on 3/13/2017 at a parcel delivery hub facility in Rialto.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



9.2 PROJECT OPERATIONAL NOISE LEVELS

Based upon the reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each of the sensitive receiver locations. The operational noise level calculations shown on Table 9-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL_1):

$$SPL_2 = SPL_1 - 20\log(D_2/D_1)$$

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 is the distance to the receiver location. Table 9-2 shows the individual operational noise levels of each noise source at each of the nearby sensitive receiver locations. As indicated on Table 9-2, the Project-only operational noise levels will range from 36.1 to 38.4 dBA L_{50} at the sensitive receiver locations. The noise levels calculated in this analysis include the barrier attenuation provided by the existing barriers in the Project study area, as shown on Exhibit 9-A, and the Project buildings themselves. Appendix 9.1 shows the operational noise level calculations for each receiver location by noise source.

TABLE 9-2: PROJECT-ONLY OPERATIONAL NOISE LEVELS

Receiver Location[1]	Noise Sources[2]	Operational Noise Levels (dBA)[3]				
		L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
R1	Roof-Top Air Conditioning Units	32.8	34.5	35.8	36.1	36.6
	Pressure Washer Activity	34.6	35.3	36.1	36.3	36.5
	Parking Lot Vehicle Movements	22.5	23.5	28.5	34.5	45.4
	Motorcycle Safety Course Activity	22.0	23.0	25.1	28.0	32.1
	Truck Movements & Storage Activity	25.6	29.1	31.4	32.4	33.8
	Combined Noise Level:	37.4	38.7	40.1	41.3	46.8
R2	Roof-Top Air Conditioning Units	32.8	34.5	35.8	36.1	36.6
	Pressure Washer Activity	36.4	37.1	37.9	38.1	38.3
	Parking Lot Vehicle Movements	6.7	7.7	12.7	18.7	29.6
	Motorcycle Safety Course Activity	24.1	25.1	27.2	30.1	34.2
	Truck Movements & Storage Activity	26.4	29.9	32.2	33.2	34.6
	Combined Noise Level:	38.4	39.7	40.9	41.4	42.5
R3	Roof-Top Air Conditioning Units	30.8	32.5	33.8	34.1	34.6
	Pressure Washer Activity	36.1	36.8	37.6	37.8	38.0
	Parking Lot Vehicle Movements	19.2	20.2	25.2	31.2	42.1
	Motorcycle Safety Course Activity	30.9	31.9	34.0	36.9	41.0
	Truck Movements & Storage Activity	25.7	29.2	31.5	32.5	33.9
	Combined Noise Level:	38.4	39.6	40.9	42.2	46.1
R4	Roof-Top Air Conditioning Units	23.2	24.9	26.2	26.5	27.0
	Pressure Washer Activity	33.4	34.1	34.9	35.1	35.3
	Parking Lot Vehicle Movements	17.8	18.8	23.8	29.8	40.7
	Motorcycle Safety Course Activity	31.6	32.6	34.7	37.6	41.7
	Truck Movements & Storage Activity	22.6	26.1	28.4	29.4	30.8
	Combined Noise Level:	36.1	37.1	38.7	40.5	45.0

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Operational noise level calculations are provided in Appendix 9.1.

Table 9-3 presents a summary of the combined total Project-only operational noise level projections at the nearby sensitive receiver locations for a comparison the City of Murrieta exterior noise level standards. The Project operational noise levels at the nearby sensitive receiver locations are shown to range from 36.1 to 38.4 dBA L_{50}. Based on the results of this analysis, the Project operational noise levels associated the Project will satisfy the City of Murrieta Municipal Code exterior noise level standards, shown on Table 9-3.

TABLE 9-3: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Noise Level at Receiver Locations (dBA)[2]					Threshold Exceeded?[3]	
		L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)	Daytime	Nighttime
Operational Standards	**Residential**	**50**	**55**	**60**	**65**	**70**	-	-
		45	**50**	**55**	**60**	**65**	-	-
R1	Residential	37.4	38.7	40.1	41.3	46.8	No	No
R2	Residential	38.4	39.7	40.9	41.4	42.5	No	No
R3	Residential	38.4	39.6	40.9	42.2	46.1	No	No
R4	Residential	36.1	37.1	38.7	40.5	45.0	No	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Estimated Project stationary source noise levels as shown on Table 9-2.
[3] Do the estimated Project stationary source noise levels exceed the exterior noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

9.3 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (4) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient conditions are presented on Tables 9-4 and 9-5 for the daytime and nighttime hours, respectively.

As indicated on Tables 9-4 and 9-5, the Project will not generate an increase on the existing ambient noise levels at the nearby receiver locations during the daytime hours, and will generate an increase of up to 0.1 during the nighttime hours at the nearby receiver locations. Since the Project-related operational noise level contributions will satisfy the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic, or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, and impacts in these regards will be *less than significant*.

TABLE 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{50})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{50})[4]	Combined Project and Ambient (dBA L_{50})[5]	Project Contribution (dBA L_{50})[6]	Threshold Exceeded?[7]
R1	37.4	L3	71.3	71.3	0.0	No
R2	38.4	L3	71.3	71.3	0.0	No
R3	38.4	L4	67.2	67.2	0.0	No
R4	36.1	L5	58.7	58.7	0.0	No

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

TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{50})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{50})[4]	Combined Project and Ambient (dBA L_{50})[5]	Project Contribution (dBA L_{50})[6]	Threshold Exceeded?[7]
R1	37.4	L3	63.9	63.9	0.0	No
R2	38.4	L3	63.9	63.9	0.0	No
R3	38.4	L4	60.0	60.0	0.0	No
R4	36.1	L5	53.7	53.8	0.1	No

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

10 CONSTRUCTION IMPACTS

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

10.1 CONSTRUCTION NOISE LEVELS

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

Mobile Equipment:

- Demolition
- Site Preparation
- Grading
- Paving

Stationary Equipment:

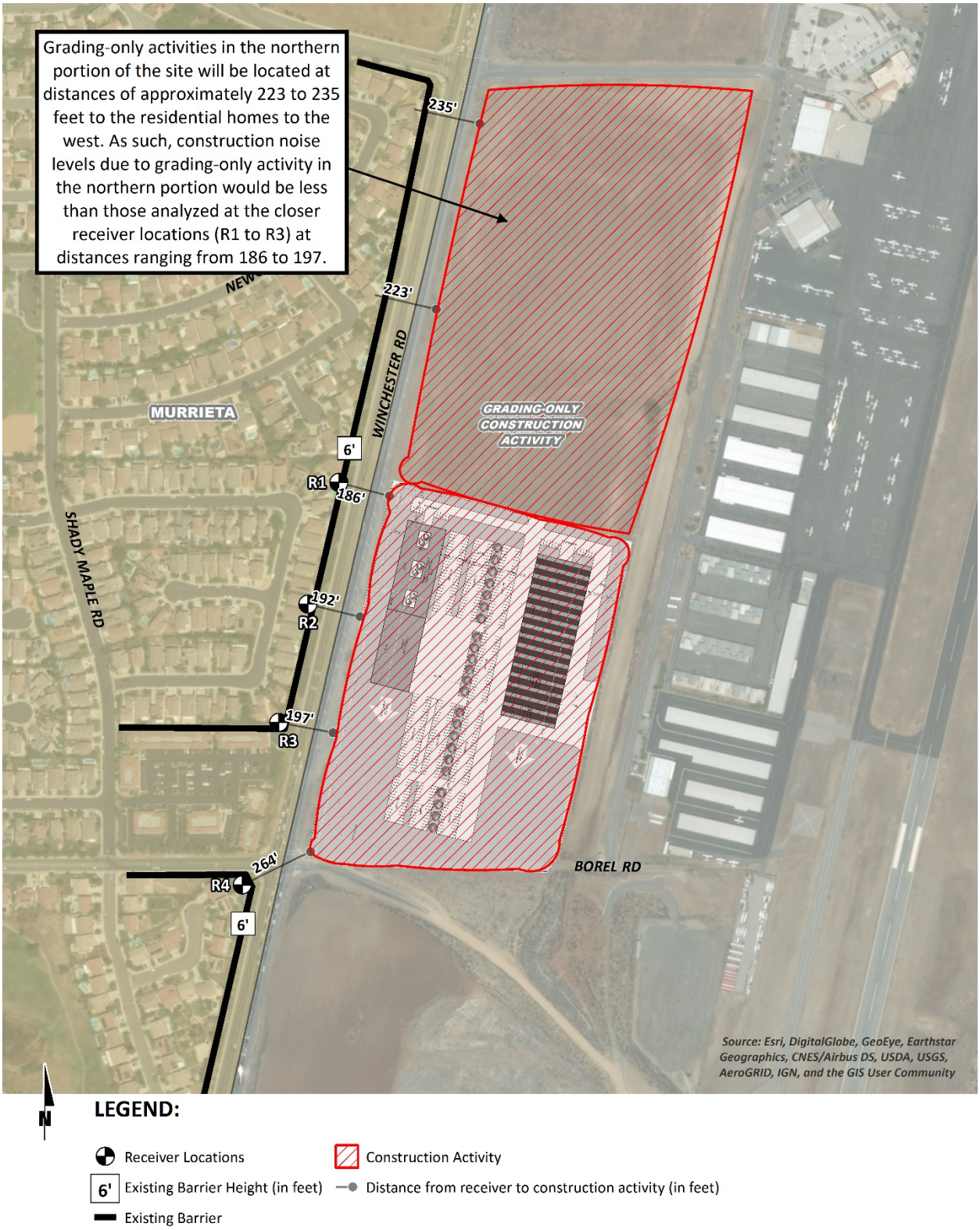
- Building Construction
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with air quality construction data provided by CASC Engineering and Consulting. (26)

OFF-SITE GRADING ACTIVITY

Grading activities planned north of the Project site will occur at distances of approximately 223 to 235 feet to the residential homes to the west, as shown on Exhibit 10-A. As such, Project construction noise levels due to the grading-only activity north of the site would be less than those analyzed at the closer receiver locations (R1 to R3) at shorter distances ranging from 186 to 197. Therefore, no further analysis is provided for noise-sensitive receiver locations since Project construction noise levels will be lower than those shown at the closer receiver locations, R1 to R3.

EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



10.2 CONSTRUCTION REFERENCE NOISE LEVELS

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

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{max})	Reference Noise Levels @ 50 Feet (dBA L_{max})[6]
1	Truck Pass-Bys & Dozer Activity[1]	0:01:15	30'	68.1	63.7
2	Dozer Activity[1]	0:01:00	30'	76.4	72.0
3	Construction Vehicle Maintenance Activities[2]	0:01:00	30'	74.8	70.4
4	Foundation Trenching[2]	0:01:01	30'	74.9	70.5
5	Rough Grading Activities[2]	0:05:00	30'	84.8	80.4
6	Framing[3]	0:02:00	30'	76.7	72.3
7	Two Scrapers Pass-By[4]	0:00:30	30'	86.9	82.5
8	Concrete Mixer Truck Movements[5]	0:01:00	50'	73.1	73.1
9	Concrete Paver Activities[5]	0:01:00	30'	75.7	71.3
10	Concrete Mixer Pour & Paving Activities[5]	0:01:00	30'	76.3	71.9
11	Concrete Mixer Backup Alarms & Air Brakes[5]	0:00:20	50'	78.8	78.8
12	Concrete Mixer Pour Activities[5]	1:00:00	50'	79.2	79.2

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

10.3 CONSTRUCTION NOISE ANALYSIS

Tables 10-2 to 10-7 show the Project construction stages and the reference construction noise levels used for each stage. Table 10-8 provides a summary of the noise levels from each stage of construction at each of the sensitive receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the highest reference noise level is operating at the edge of primary construction activity nearest each sensitive receiver location will range from 52.5 to 66.1 dBA L_{max} at the sensitive receiver locations, as shown on Table 10-8.

TABLE 10-2: DEMOLITION MOBILE EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	72.0

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	55.6
R2	192'	-11.7	-5.0	55.3
R3	197'	-11.9	-5.0	55.1
R4	264'	-14.5	-5.0	52.5

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

TABLE 10-3: SITE PREPARATION MOBILE EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	72.0

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	55.6
R2	192'	-11.7	-5.0	55.3
R3	197'	-11.9	-5.0	55.1
R4	264'	-14.5	-5.0	52.5

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

TABLE 10-4: GRADING MOBILE EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Truck Pass-Bys & Dozer Activity	63.7
Dozer Activity	72.0
Rough Grading Activities	80.4
Two Scrapers Pass-By	82.5
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	82.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	66.1
R2	192'	-11.7	-5.0	65.8
R3	197'	-11.9	-5.0	65.6
R4	264'	-14.5	-5.0	63.0

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

TABLE 10-5: PAVING MOBILE EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Concrete Mixer Truck Movements	73.1
Concrete Paver Activities	71.3
Concrete Mixer Pour & Paving Activities	71.9
Concrete Mixer Backup Alarms & Air Brakes	78.8
Concrete Mixer Pour Activities	79.2
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	79.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	62.8
R2	192'	-11.7	-5.0	62.5
R3	197'	-11.9	-5.0	62.3
R4	264'	-14.5	-5.0	59.7

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

TABLE 10-6: BUILDING CONSTRUCTION STATIONARY EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Construction Vehicle Maintenance Activities	70.4
Foundation Trenching	70.5
Framing	72.3
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	72.3

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	55.9
R2	192'	-11.7	-5.0	55.6
R3	197'	-11.9	-5.0	55.4
R4	264'	-14.5	-5.0	52.8

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

TABLE 10-7: ARCHITECTURAL COATING STATIONARY EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{max})
Construction Vehicle Maintenance Activities	70.4
Framing	72.3
Highest Reference Noise Level at 50 Feet (dBA L_{max}):	72.3

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA)[3]	Estimated Noise Barrier Attenuation (dBA)[4]	Construction Noise Level (dBA L_{max})
R1	186'	-11.4	-5.0	55.9
R2	192'	-11.7	-5.0	55.6
R3	197'	-11.9	-5.0	55.4
R4	264'	-14.5	-5.0	52.8

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

10.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when equipment is operating at the closest point to each receiver location. As shown on Table 10-8, the unmitigated construction noise levels experienced at the nearby sensitive receiver locations are expected to range from 52.5 to 66.1 dBA L_{max} for mobile equipment, and between 52.8 to 55.9 dBA L_{max} for stationary equipment at the sensitive receiver locations.

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Stage Hourly Noise Level (dBA L_{max})						
	Mobile Equipment				Stationary Equipment		Highest Noise Levels[2]
	Demolition	Site Preparation	Grading	Paving	Building Construction	Architectural Coating	
R1	55.6	55.6	66.1	62.8	55.9	55.9	66.1
R2	55.3	55.3	65.8	62.5	55.6	55.6	65.8
R3	55.1	55.1	65.6	62.3	55.4	55.4	65.6
R4	52.5	52.5	63.0	59.7	52.8	52.8	63.0

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise levels across all stages of Project construction.

Table 10-8 shows the highest construction noise levels at the potentially impacted receiver locations are expected to approach 66.1 dBA L_{max} from mobile equipment, and 55.9 dBA L_{max} for stationary equipment and will satisfy the City of Murrieta Municipal Code construction noise level standards of 75 dBA L_{max} for mobile equipment and 60 dBA L_{max} for stationary equipment during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at all nearby sensitive receiver locations.

TABLE 10-9: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE (DBA L_{MAX})

Receiver Location[1]	Land Use Category	Highest Construction Activity Noise Levels[2]		Noise Level Threshold[3]		Threshold Exceeded?[4]	
		Mobile Equipment	Stationary Equipment	Mobile Equipment	Stationary Equipment	Mobile Equipment	Stationary Equipment
R1	Single-Family Residential	66.1	55.9	75	60	No	No
R2	Single-Family Residential	65.8	55.6	75	60	No	No
R3	Single-Family Residential	65.6	55.4	75	60	No	No
R4	Single-Family Residential	63.0	52.8	75	60	No	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise levels of mobile and stationary equipment, as shown on Table 10-8.
[3] Construction noise standards as shown on Table 3-2 and 3-3.
[4] Do the estimated Project construction noise levels exceed the construction noise level thresholds?

10.5 CONSTRUCTION VIBRATION IMPACTS

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

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

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

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. At distances ranging from 186 to 264 feet from the Project construction activities, construction vibration velocity levels are expected to approach 0.004 in/sec PPV, as shown on Table 10-10. To assess the human perception of vibration levels in PPV, as previously discussed in Section 3, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 10-10 shows the construction vibration levels in RMS are expected to approach 0.003 in/sec (RMS). Therefore, the Project-related vibration impacts will satisfy the County of Riverside and City of Murrieta 0.01 in/sec RMS thresholds, and impacts are considered *less than significant* during the construction activities at the Project site.

Further, the vibration levels due to Project construction do not represent vibration levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (3) The peak Project-construction vibration levels shown on Table 10-10, approaching 0.004 in/sec PPV, will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the levels at the site of the closest sensitive receivers 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.

TABLE 10-10: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance To Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					RMS Velocity Levels (in/sec)[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration (PPV)		
R1	186'	0.000	0.002	0.004	0.004	0.004	0.003	No
R2	192'	0.000	0.002	0.004	0.004	0.004	0.003	No
R3	197'	0.000	0.002	0.003	0.004	0.004	0.003	No
R4	264'	0.000	0.001	0.002	0.003	0.003	0.002	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.
[3] 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.
[4] Does the peak vibration exceed the maximum acceptable vibration threshold shown on Table 3-4?

10.6 CONSTRUCTION NOISE AND VIBRATION BEST PRACTICES

Though construction noise and vibration are temporary, intermittent, will be short in duration, and will not present any long-term impacts, the following best practices would further reduce noise and vibration levels produced by the construction equipment to the nearby sensitive land uses.

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May (County of Riverside Municipal Code, Section 9.52.020). The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).
- The construction contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2017.
2. **Urban Crossroads, Inc.** *KTM French Valley Traffic Impact Analysis.* August 2018.
3. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
4. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
5. **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.
6. **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.* June, 1995.
7. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
8. **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.
9. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
10. **Center for Disease Control and Prevention.** About Hearing Loss. [Online] [Cited: 04 15, 2016.] http://www.cdc.gov/healthyschools/noise/signs.htm.
11. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2003.
12. **State of California.** *2013 California Green Building Standards Code.* January 2014.
13. **County of Riverside.** *General Plan Noise Element.* December 2015.
14. —. *General Plan Noise Element.* December 2014.
15. **County of Riverside Office of Industrial Hygiene.** *Requirements for determining and mitigating traffic noise impacts to residential structures.* May 2015.
16. **City of Murrieta.** *Municipal Code, Chapter 16.30 Noise.*
17. **County of Riverside.** *Municipal Code, Chapter 9.52 Noise Regulation.*
18. —. *Airport Land Use Compatibility Plan.* October 2004.
19. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
20. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
21. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
22. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.

23. **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.

24. **County of Riverside.** *General Plan Amendment No. 960 Environmental Impact Report, Appendix EIR-7.* March 2011.

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

26. **CASC Engineering and Consulting.** *KTM French Valley Air Quality Data.* July 2018.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed KTM French Valley 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

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APPENDIX 3.1:

CITY OF MURRIETA MUNICIPAL CODE

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16.30 Noise

Sections:

16.30.010 Purpose.

The purpose of this chapter is to establish standards to protect the health, safety, and welfare of those living and working in the city and to implement policies of the general plan noise element.

(Ord. 182 § 2 (part), 1997)

16.30.020 Declaration of Policy.

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

(Ord. 182 § 2 (part), 1997)

16.30.030 Definitions.

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

A-Weighted Sound Level. The sound level in decibels as measured on a sound level meter using the A-weighting network. The level so read is designated dB(A) or dBA.

Ambient Noise Histogram. The composite of all noise from sources near and far, excluding the alleged intrusive noise source. In this context, the ambient noise histogram shall constitute the normal or existing level of environmental noise at a given location.

Cumulative Period. An additive period of time composed of individual time segments which may be continuous or interrupted.

Decibel. A unit for measuring the amplitude of a sound, equal to twenty (20) times the logarithm to the base of ten of the ratio of the pressure of the sound measured to the reference pressure, which is twenty (20) micropascals.

Emergency Machinery, Vehicle or Alarm. Any machinery, vehicle or alarm used, employed, performed or operated in an effort to protect, provide or restore safe conditions in the community, or work by private or public utilities when restoring utility service.

Emergency Work. Work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

Fixed Noise Source. A stationary device which creates sounds while fixed or motionless, including, but not limited to, residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners and refrigeration equipment.

Impulsive Noise. A sound of short duration, usually less than one second and of high intensity, with an abrupt onset and rapid decay.

Intrusive Noise. The alleged offensive noise that intrudes over and above the existing ambient noise at the receptor property.

Mobile Noise Source. A noise source other than a fixed noise source.

Noise Disturbance. An alleged intrusive noise that violates an applicable noise standard of this chapter. Noise Histogram. A graphical representation of the distribution of frequency of occurrence of all noise levels near and far measured over a given period of time.

Noise Level (L_N). The noise level expressed in decibels that exceeds the specified (L,) value a percentage of total time measured. For example, an L25 noise level means that noise level that is exceeded twenty-five (25) percent of the time measured.

Noise-Sensitive Area. An area designated for the purpose of ensuring exceptional quiet (e.g.. around hospitals, nursing homes, libraries, and similar uses).

NoiseZone. A defined area of a generally consistent land use.

Pure Tone Noise. A sound that can be judged as audible as a single pitch or a set of single pitches by the code enforcement officer. For the purposes of this chapter, a pure tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound-pressure levels of the two contiguous one-third octave bands by five dB for center frequencies of five hundred (500) Hertz and above, and by eight dB for center frequencies between one hundred sixty (160) and four hundred (400) Hertz, and by fifteen (15) dB for center frequencies less than or equal to one hundred twenty-five (125) Hertz.

Sound Level Meter. An instrument, including a microphone, an amplifier, an output meter and frequency weighting network, for the measurement of sound levels, that satisfies the requirements pertinent for Type

S2A meters in American National Standards Institute specifications for sound level meters.

Vibration. The minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration including, but not limited to, sensation by touch or visual observations of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 in/sec over the range of one to one hundred (100) Hertz.

Weekday. Any day. Monday through Friday, that is not a legal holiday.

(Ord. 182 § 2 (part), 1997)

16.30.040 Enforcement of Regulations.

The code enforcement officer shall have primary responsibility for the enforcement of the noise regulations contained in this chapter. The code enforcement officer shall make all noise-level measurements required for the enforcement of this chapter.

(Ord. 182 § 2 (part), 1997)

16.30.050 Initial Violations.

In the event of an initial violation of the provisions of this chapter, a written notice of violation shall be given the alleged violator. specifying the time by which the condition shall be corrected or an application for a permit or variance shall be filed. No further action shall be taken if the cause of the violation has been removed, the condition abated, or fully corrected within the time period specified in the written notice.

(Ord. 182 § 2 (part), 1997)

16.30.060 Activities Exempt from Regulations.

The following activities shall be exempt from the provisions of this chapter:

A. Emergency Exemption. The emission of sound for the purpose of alerting persons to the existence of an emergency, or the emission of sound in the performance of emergency work.

B. Warning Device. Warning devices necessary for the protection of public safety, (e.g., police, tire and ambulance sirens, and train horns).

C. Outdoor Activities. Activities conducted on public playgrounds and public or private school grounds. including, but not limited to, school athletic and school entertainment events.

D. Motion Picture Production and Related Activities. Activities in connection to production of motion pictures.

E. Railroad Activities. All locomotives and rail cars operated by any railroad which is regulated by the state Public Utilities Commission.

F. Federal or State Pre-Exempted Activities. Any activity, to the extent regulation thereof has been pre-empted by state or federal law,

G. Public Health and Safety Activities. All transportation, flood control, and utility company maintenance and construction operations at any time on public right-of-way, and those situations that may occur on private real property deemed necessary to serve the best interest of the public and to protect the public's health and well being, including, but not limited to, street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, house

moving, vacuuming catchbasins, removal of damaged poles and vehicles, repair of water hydrants and mains, gas lines, oil lines, sewers, etc.

H. Motor, Vehicles on Public Right-of-Way and Private Property. Except as provided in this chapter, all vehicles operating in a legal manner in compliance with local, state, and federal vehicle noise regulations within the public right-of-way or on private property.

1. Minor Maintenance to Residential Real Property. Noise sources associated with the minor maintenance of residential real property, provided the activities take place between the hours of seven a.m. and eight p.m. on any day except Sunday, or between the hours of nine a.m. and eight p.m. on Sunday.

(Ord. 182 § 2 (part), 1997)

16.30.070 Decibel Measurement.

Decibel measurements made in compliance with the provisions of this chapter shall be based on a reference sound-pressure of twenty (20) micropascals, as measured with a sound level meter using the A-weighted network (scale) at slow response, or at the fast response when measuring impulsive sound levels and vibrations.

(Ord. 182 § 2 (part). 1997)

16.30.080 Noise Zones Designated.

Receptor properties described in this chapter are hereby assigned to the following noise zones:

A. Noise zone I, noise-sensitive area:

B. Noise zone II, residential properties;

C. Noise zone Ill, commercial properties: and

D. Noise zone IV, industrial properties.

(Ord. 182 § 2 (part), 1997)

16.30.090 Exterior Noise Standards.

A. Standards for Noise Zones. Unless otherwise provided in this chapter, the following exterior noise levels shall apply to all receptor properties within a designated noise zone:

TABLE 3-6
EXTERIOR NOISE STANDARDS

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Allowed Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential properties Residential properties within five hundred (500) feet of a kennel(s)	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime) 7:00 a.m. to 10:00 p.m.	45 50 70
III	Commercial properties	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime)	55 60

IV	Industrial properties	Anytime	70

B. Noise Standards. No person shall operate or cause to be operated. any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by a person that causes the noise level, when measured on any other property to exceed the following exterior noise standards:

1. Standard No.1. Standard No. 1 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than thirty (30) minutes in any hour. Standard No. 1 may be the applicable noise level from Table 3-6 above.

2. Standard No. 2. Standard No. 2 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than fifteen (15) minutes in any hour. Standard No. 2 shall be the applicable noise level from Table 3-6 above, plus five dB.

3. Standard No.3. Standard No. 3 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than five minutes in any hour. Standard No. 3 shall be the applicable noise level from Table 3-6 above plus ten dB.

4. Standard No.4. Standard No. 4 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from Table 3-6 above plus fifteen (15) dB.

5. Standard No. 5. Standard No. 5 shall be the exterior noise level which shall not be exceeded for any period of time. Standard No. 5 shall be the applicable noise level from Table 3-6 above plus twenty (20) dB.

C. Noise at Zone Boundaries. If the measurement location is on a boundary property between two different zoning districts, the exterior noise level utilized in subsection B of this chapter to determine the exterior standard shall be the arithmetic mean of the exterior noise levels. as specified in Table 3-6, of the subject zones.

D. Measurement of Ambient Noise Histogram. The ambient noise histogram shall be measured at the same location along the property line utilized in subsection B. above, with the alleged intruding noise source inoperative. If the alleged intruding noise source cannot be turned off, the ambient noise histogram shall be estimated by performing a measurement in the same general area of the alleged intruding noise source but at a sufficient distance so that the noise from the alleged intruding noise source is at least ten dB below the ambient noise histogram.

E. Abatement Notice in Lieu of Citation. If the intrusive noise exceeds the exterior noise standards provided in subsections A and B above, at a specific receptor property and the code enforcement officer has reason to believe that this violation was unanticipated and due to abnormal conditions, the code enforcement officer shall issue an abatement notice in lieu of a citation. lithe specific violation is abated, no citation shall be is-sued. If the specific violation is not abated, the code enforcement officer shall issue a citation.

(Ord. 182 § 2 (part), 1997)

16.30.100 Interior Noise Standards for Multi-Family Residential.

A. Noise Standards for Residential Units. No person shall operate or cause to be operated within a residential unit. any source of sound, or allow the creation of any noise, that causes the noise level when measured inside a neighboring receiving residential unit to exceed the following standards:

1. Standard No.1. The applicable interior noise level for cumulative period of more than five minutes in any hour;

2. Standard No.2. The applicable interior noise level plus five dB for a cumulative period of more than one minute in any hour; or

3. Standard No.3. The applicable interior noise level plus ten dB for any period of time.

B. Interior Noise Levels for Multi-Family Residential. The following interior noise levels shall apply within multi-family dwellings with windows in their normal seasonal configuration.

Noise Zone	Designated Land Use	Time Interval	Allowable Interior Noise Level(dBl
All	Multi-family Residential	10:00 p.m.—7:00 a.m. 7:00 a.m.—10:00 p.m.	40 45

If the measured ambient noise level reflected by the L_{50} exceeds that permissible within the interior noise standards in subsection A above. the allowable interior noise level shall be increased in five dB increments to reflect the ambient noise level (L5,,).

(Ord. 182 § 2 (part), 1997)

16.30.110 Correction for Certain Types of Sounds.

For any source of sound that emits a pure tone or impulsive noise, the allowed noise levels provided in Sections 1 6.30.090 (Exterior Noise Standards) and 16.30.100 (Interior Noise Standards for Multi-family Residential) shall be reduced by five decibels.

(Ord. 182 § 2 (part). 1997)

16.30.120 Measurement Methods.

A. A-weighting Scale. The noise level shall be measured at a position(s) at any point on the receiver's property utilizing the A-weighting scale of the sound-level meter and the slow meter response (use fast response for impulsive type sounds). Calibration of the measurement equipment, utilizing an acoustic calibrator, shall be performed immediately prior to recording any noise data.

B. Microphone Location. The microphone shall be located four to five feet above the ground and ten feet or more from the nearest reflective surface except in those cases where another elevation is deemed appropriate.

C. Interior Noise. Interior noise measurements shall be made within the affected residential unit. The measurements shall be made at a point at least four feet from the wall, ceiling or floor nearest the noise source, with windows in the normal seasonal configuration.

(Ord. 182 § 2 (part), 1997)

16.30.130 Acts Deemed Violations of Chapter.

The following acts are a violation of this chapter.

A. Construction Noise.

1. Operating or causing the operation of tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of seven p.m. and seven a.m., or at any time on

Sundays or holidays. so that the sound creates a noise disturbance across a residential or commercial property line, except for emergency work of public service utilities.

2. Construction activities shall be conducted in a manner that the maximum noise levels at the affected structures will not exceed those listed in the following schedule:

a. Residential Structures:

1) Mobile Equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment:

	Single-family Residential	Multi-family Residential	Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA

2) Stationary Equipment. Maximum noise level for repetitively scheduled and relatively long-term operation periods (three days or more) of stationary equipment:

	Single-family Residential	Multi-family Residential	Commercial
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

b. Business Structures. Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment: daily. including Sundays and legal holidays, all hours: maximum of eighty-five (85) dBA.

3. All mobile or stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air-intake silencers in proper working order.

B. Loading and Unloading Operations. Loading, unloading, opening, closing or other handling of boxes. crates, containers, building materials, garbage cans or similar objects between the hours of ten p.m. and six am. in a manner to cause a noise disturbance is prohibited.

C. Noise Disturbances in Noise-Sensitive Zones. Creating or causing the creation of a noise disturbance within a noise-sensitive zone is prohibited, provided that conspicuous signs are displayed indicating the presence of the zone. Noise-sensitive zones shall be indicated by the display of conspicuous signs in at least three separate locations within five hundred (500) feet of the institution or facility (e.g., health care facility)

D. Places of Public Entertainment. Operating, playing, or permitting the operation or playing of a radio, television. phonograph, drum, musical instrument, sound amplifier or similar device that produces, reproduces, or amplifies sound in a place of public entertainment at a sound level greater than ninety-five (95) dBA, (read by the slow response on a sound level meter) at any point that is normally occupied by a customer is prohibited, unless conspicuous signs are located near each public entrance stating, "Warning: Sound Levels Within May Cause Hearing Impairment."

E. Emergency Signaling Devices.

1. The intentional sounding or permitting the sounding outdoors of an emergency signaling device, including fire, burglar or civil defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing is prohibited.

2. Testing of a stationary emergency signaling device shall not occur before seven a.m. or after seven p.m. Testing shall use only the minimum cycle test time. Test time shall not exceed sixty (60) seconds. Testing of the complete emergency signaling system, including the functioning of the signaling device, and the personnel response to the signaling device, shall not occur more than once in each calendar month. Testing shall not occur before seven a.m. or after ten p.m.

3. Sounding or permitting the sounding of an exterior burglar or fire alarm, or motor vehicle burglar alarm

is prohibited, unless the alarm is terminated within fifteen (15) minutes of activation.

F. Stationary Nonemergency Signaling Devices. Sounding or permitting the sounding of an electronically amplified signal from a stationary bell, chime, siren. whistle, or similar device intended primarily for nonemergency purposes, from any place, for more than ten consecutive seconds in any hourly period is prohibited.

G. Refuse Collection Vehicles.

1. Operating or permitting the operation of the compacting mechanism of any motor vehicle that compacts refuse and that creates, during the compacting cycle, a sound level in excess of eighty-six (86) dBA when measured at fifty (50) feet from any point of the vehicle is prohibited.

2. Collecting refuse, or operating or permitting the operation of the compacting mechanism of any motor vehicle that compacts refuse between the hours often p.m. and six a.m. the following day in a residential area or noise-sensitive zone is prohibited.

H. Sweepers and Associated Equipment. Operating or permitting the operation of sweepers or associated sweeping equipment (i.e., blowers) between the hours often p.m. and six a.m. the following day in, or adjacent to, a residential area or noise-sensitive area is prohibited.

I. Residential Air Conditioning or Refrigeration Equipment. Operating or permitting the operation of air conditioning or refrigeration equipment in a manner that exceeds the following sound levels is prohibited:

Measurement Location	Maximum Noise level
Any point on neighboring property line, five feet above grade level, no closer than three feet from any wall.	55
Center of neighboring patio, five feet above grade level, no closer than three feet from any wall.	50
Outside the neighboring living area window nearest the equipment location, not more than three feet from the window opening, but at least three feet from any other surface.	50

J. Vehicle or Motorboat Repairs and Testing. Repairing, rebuilding, modifying or testing any motor vehicle, motorcycle or motorboat in a manner as to cause a noise disturbance across property lines or within a noise-sensitive zone is prohibited.

K. Vibration. Operating or permitting the operation of any device that creates vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on

private property, or at one hundred fifty (150) feet from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz.

(Ord. 182 § 2 (part), 1997)

16.30.140 Modification of Standards.

Modifications to the requirements of this chapter may be granted by the director for a period of up to two years, subject to any terms, conditions, or requirements to minimize adverse effects on the surrounding neighborhood reasonable. Modifications may be granted only if one of the following findings can be made:

A. Additional time is necessary for the applicant to alter or modify the activity, operation, or noise source to comply with this chapter: or

B. The activity, operation, or noise source cannot feasibly be done in a manner that would comply with the provisions of this chapter. and no other reasonable alternative is available to the applicant.

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APPENDIX 5.1:

STUDY AREA PHOTOS

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L1_E

L1_NW

L1_S

L1_SE

L1_W

L1N

L2_E

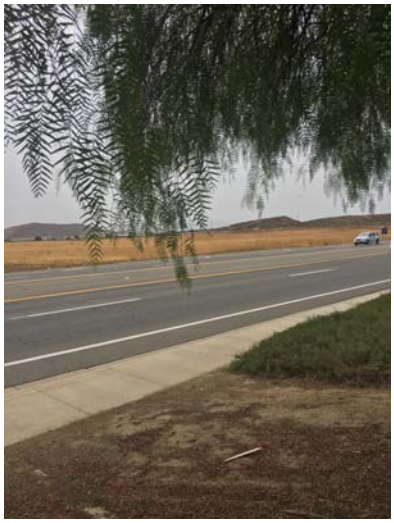
L2_NE

L2_SE

L3_E

L3_NE

L3_S



L3_SE

L4_E

L4_S

L4_W

L5_E

L5_N

L5_NW

L5_W

L6_E

L6_SW

L6_W

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

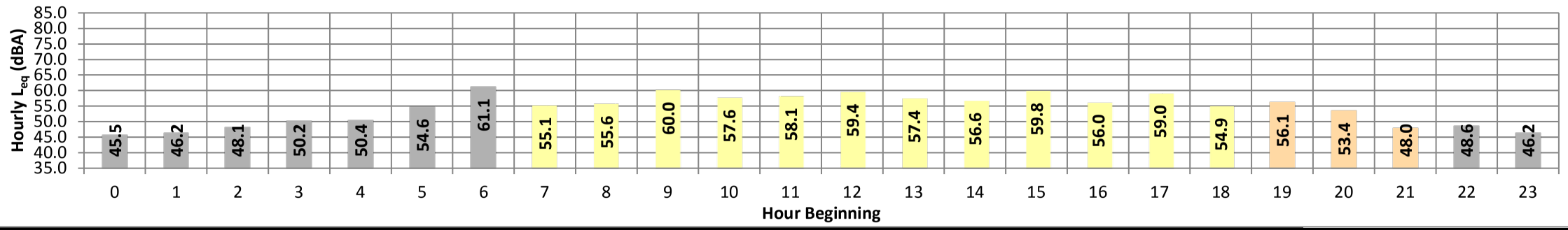
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L1 - Located north of the Project site on Sparkman Way adjacent to a French Valley Airport parking lot and vacant land.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	45.5	61.0	38.8	53.0	52.0	51.0	47.0	45.0	43.0	39.0	39.0	39.0	45.5	10.0	55.5
	1	46.2	70.9	37.7	52.0	50.0	49.0	48.0	45.0	43.0	39.0	39.0	39.0	46.2	10.0	56.2
	2	48.1	61.9	36.2	54.0	53.0	52.0	51.0	49.0	46.0	42.0	40.0	39.0	48.1	10.0	58.1
	3	50.2	59.3	41.8	56.0	55.0	54.0	53.0	50.0	49.0	45.0	45.0	43.0	50.2	10.0	60.2
	4	50.4	63.6	43.0	57.0	56.0	54.0	53.0	51.0	48.0	45.0	45.0	43.0	50.4	10.0	60.4
	5	54.6	72.3	43.7	61.0	60.0	59.0	58.0	55.0	51.0	47.0	46.0	45.0	54.6	10.0	64.6
	6	61.1	88.6	43.1	67.0	63.0	57.0	54.0	50.0	47.0	45.0	44.0	43.0	61.1	10.0	71.1
Day	7	55.1	75.6	41.8	68.0	64.0	59.0	56.0	51.0	47.0	44.0	44.0	42.0	55.1	0.0	55.1
	8	55.6	75.7	42.0	68.0	66.0	59.0	56.0	52.0	48.0	45.0	44.0	42.0	55.6	0.0	55.6
	9	60.0	78.5	43.6	72.0	70.0	66.0	63.0	56.0	51.0	46.0	46.0	44.0	60.0	0.0	60.0
	10	57.6	78.8	43.9	70.0	66.0	61.0	59.0	54.0	50.0	46.0	45.0	44.0	57.6	0.0	57.6
	11	58.1	79.8	43.1	70.0	67.0	62.0	60.0	54.0	50.0	46.0	45.0	44.0	58.1	0.0	58.1
	12	59.4	80.4	46.1	72.0	70.0	64.0	60.0	55.0	52.0	49.0	48.0	47.0	59.4	0.0	59.4
	13	57.4	79.4	47.1	67.0	64.0	60.0	59.0	55.0	53.0	50.0	49.0	48.0	57.4	0.0	57.4
	14	56.6	71.2	47.6	66.0	64.0	60.0	59.0	56.0	54.0	51.0	50.0	49.0	56.6	0.0	56.6
	15	59.8	87.7	47.4	68.0	64.0	60.0	58.0	55.0	52.0	50.0	49.0	48.0	59.8	0.0	59.8
	16	56.0	71.7	47.7	65.0	63.0	60.0	58.0	55.0	54.0	51.0	50.0	49.0	56.0	0.0	56.0
	17	59.0	77.7	47.5	69.0	67.0	64.0	62.0	57.0	54.0	50.0	49.0	48.0	59.0	0.0	59.0
	18	54.9	68.5	45.5	63.0	61.0	58.0	57.0	55.0	53.0	50.0	49.0	47.0	54.9	0.0	54.9
Evening	19	56.1	81.1	44.0	66.0	62.0	58.0	57.0	54.0	51.0	48.0	46.0	45.0	56.1	5.0	61.1
	20	53.4	75.1	40.8	61.0	59.0	56.0	54.0	52.0	50.0	45.0	44.0	43.0	53.4	5.0	58.4
	21	48.0	67.3	39.1	54.0	53.0	52.0	51.0	48.0	45.0	40.0	40.0	39.0	48.0	5.0	53.0
Night	22	48.6	70.6	36.1	54.0	53.0	52.0	51.0	49.0	46.0	41.0	40.0	39.0	48.6	10.0	58.6
	23	46.2	64.6	36.1	53.0	52.0	51.0	49.0	46.0	44.0	39.0	38.0	36.0	46.2	10.0	56.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	54.9	68.5	41.8	63.0	61.0	58.0	56.0	51.0	47.0	44.0	44.0	42.0
	Max	60.0	87.7	47.7	72.0	70.0	66.0	63.0	57.0	54.0	51.0	50.0	49.0
Energy Average		57.8	Average:		68.2	65.5	61.1	58.9	54.6	51.5	48.2	47.3	46.0
Evening	Min	48.0	67.3	39.1	54.0	53.0	52.0	51.0	48.0	45.0	40.0	40.0	39.0
	Max	56.1	81.1	44.0	66.0	62.0	58.0	57.0	54.0	51.0	48.0	46.0	45.0
Energy Average		53.6	Average:		60.3	58.0	55.3	54.0	51.3	48.7	44.3	43.3	42.3
Night	Min	45.5	59.3	36.1	52.0	50.0	49.0	47.0	45.0	43.0	39.0	38.0	36.0
	Max	61.1	88.6	43.7	67.0	63.0	59.0	58.0	55.0	51.0	47.0	46.0	45.0
Energy Average		53.6	Average:		56.3	54.9	53.2	51.6	48.9	46.3	42.4	41.8	40.7

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
56.2	57.2	53.6

24-Hour CNEL (dBA)

61.0

24-Hour Noise Level Measurement Summary

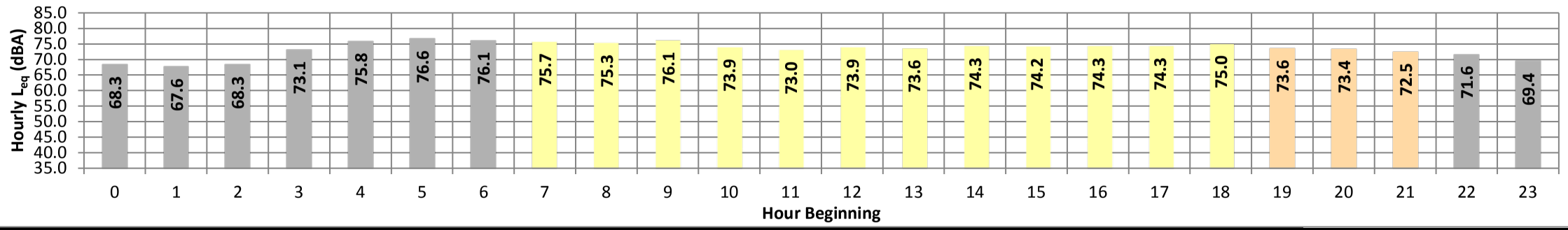
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L2 - Located north of the Project site on Winchester Road adjacent to existing residential homes.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	68.3	92.4	35.3	77.0	76.0	74.0	73.0	68.0	60.0	44.0	41.0	38.0	68.3	10.0	78.3
	1	67.6	85.7	35.3	77.0	76.0	74.0	73.0	67.0	58.0	42.0	40.0	38.0	67.6	10.0	77.6
	2	68.3	82.0	38.2	78.0	77.0	75.0	74.0	68.0	59.0	44.0	42.0	39.0	68.3	10.0	78.3
	3	73.1	84.7	44.1	81.0	80.0	79.0	78.0	74.0	68.0	53.0	50.0	47.0	73.1	10.0	83.1
	4	75.8	92.9	50.1	82.0	81.0	80.0	79.0	77.0	73.0	61.0	59.0	54.0	75.8	10.0	85.8
	5	76.6	96.4	51.4	83.0	82.0	80.0	80.0	77.0	74.0	61.0	57.0	53.0	76.6	10.0	86.6
	6	76.1	91.9	51.2	81.0	81.0	80.0	79.0	77.0	74.0	63.0	61.0	58.0	76.1	10.0	86.1
Day	7	75.7	95.4	49.9	80.0	80.0	79.0	79.0	77.0	74.0	62.0	59.0	56.0	75.7	0.0	75.7
	8	75.3	98.7	46.9	80.0	79.0	78.0	78.0	76.0	74.0	61.0	58.0	51.0	75.3	0.0	75.3
	9	76.1	102.9	44.1	81.0	79.0	78.0	77.0	76.0	73.0	61.0	59.0	52.0	76.1	0.0	76.1
	10	73.9	85.9	45.7	79.0	79.0	78.0	77.0	75.0	73.0	62.0	59.0	52.0	73.9	0.0	73.9
	11	73.0	86.3	47.8	78.0	78.0	77.0	76.0	74.0	72.0	60.0	57.0	51.0	73.0	0.0	73.0
	12	73.9	92.6	51.4	80.0	79.0	78.0	77.0	75.0	72.0	61.0	58.0	54.0	73.9	0.0	73.9
	13	73.6	91.4	49.4	79.0	78.0	77.0	77.0	75.0	72.0	62.0	59.0	54.0	73.6	0.0	73.6
	14	74.3	91.7	51.7	80.0	79.0	78.0	77.0	75.0	73.0	63.0	61.0	57.0	74.3	0.0	74.3
	15	74.2	93.9	52.3	80.0	79.0	78.0	77.0	75.0	72.0	63.0	60.0	56.0	74.2	0.0	74.2
	16	74.3	88.4	53.8	80.0	79.0	78.0	77.0	75.0	73.0	65.0	63.0	60.0	74.3	0.0	74.3
	17	74.3	94.1	49.4	80.0	79.0	78.0	78.0	76.0	72.0	62.0	61.0	57.0	74.3	0.0	74.3
	18	75.0	93.5	49.7	81.0	80.0	79.0	78.0	76.0	73.0	63.0	60.0	56.0	75.0	0.0	75.0
Evening	19	73.6	90.8	48.1	80.0	79.0	78.0	77.0	75.0	71.0	60.0	57.0	52.0	73.6	5.0	78.6
	20	73.4	90.9	50.3	80.0	79.0	77.0	77.0	74.0	71.0	61.0	58.0	54.0	73.4	5.0	78.4
	21	72.5	89.7	42.2	79.0	78.0	77.0	76.0	74.0	69.0	56.0	52.0	48.0	72.5	5.0	77.5
Night	22	71.6	93.3	40.9	79.0	77.0	76.0	75.0	72.0	67.0	52.0	49.0	44.0	71.6	10.0	81.6
	23	69.4	90.3	35.3	78.0	77.0	75.0	74.0	70.0	63.0	45.0	41.0	37.0	69.4	10.0	79.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	73.0	85.9	44.1	78.0	78.0	77.0	76.0	74.0	72.0	60.0	57.0	51.0
	Max	76.1	102.9	53.8	81.0	80.0	79.0	79.0	77.0	74.0	65.0	63.0	60.0
Energy Average		74.6	Average:		79.8	79.0	78.0	77.3	75.4	72.8	62.1	59.5	54.7
Evening	Min	72.5	89.7	42.2	79.0	78.0	77.0	76.0	74.0	69.0	56.0	52.0	48.0
	Max	73.6	90.9	50.3	80.0	79.0	78.0	77.0	75.0	71.0	61.0	58.0	54.0
Energy Average		73.2	Average:		79.7	78.7	77.3	76.7	74.3	70.3	59.0	55.7	51.3
Night	Min	67.6	82.0	35.3	77.0	76.0	74.0	73.0	67.0	58.0	42.0	40.0	37.0
	Max	76.6	96.4	51.4	83.0	82.0	80.0	80.0	77.0	74.0	63.0	61.0	58.0
Energy Average		73.2	Average:		79.6	78.6	77.0	76.1	72.2	66.2	51.7	48.9	45.3

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
73.9	74.3	73.2

24-Hour CNEL (dBA)

80.0

24-Hour Noise Level Measurement Summary

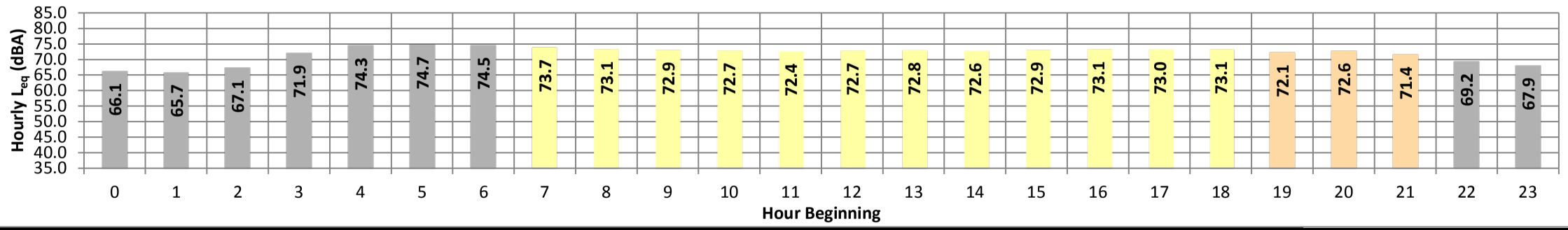
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L3 - Located west of the Project site across Winchester Road adjacent to existing residential homes.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	66.1	81.9	35.8	77.0	75.0	72.0	71.0	65.0	54.0	40.0	38.0	36.0	66.1	10.0	76.1
	1	65.7	80.8	35.9	76.0	75.0	72.0	71.0	65.0	54.0	39.0	38.0	36.0	65.7	10.0	75.7
	2	67.1	82.4	36.2	77.0	76.0	74.0	72.0	66.0	56.0	42.0	40.0	38.0	67.1	10.0	77.1
	3	71.9	84.2	41.1	80.0	79.0	78.0	77.0	73.0	67.0	50.0	48.0	44.0	71.9	10.0	81.9
	4	74.3	88.6	44.0	80.0	79.0	78.0	78.0	76.0	72.0	59.0	54.0	49.0	74.3	10.0	84.3
	5	74.7	91.8	46.5	81.0	79.0	78.0	78.0	76.0	73.0	60.0	55.0	48.0	74.7	10.0	84.7
	6	74.5	89.5	43.9	79.0	79.0	78.0	77.0	76.0	73.0	62.0	56.0	48.0	74.5	10.0	84.5
Day	7	73.7	83.9	42.6	78.0	78.0	77.0	76.0	75.0	73.0	62.0	54.0	45.0	73.7	0.0	73.7
	8	73.1	87.9	43.0	78.0	77.0	76.0	76.0	74.0	72.0	60.0	54.0	46.0	73.1	0.0	73.1
	9	72.9	85.9	42.7	78.0	77.0	76.0	76.0	74.0	72.0	63.0	59.0	49.0	72.9	0.0	72.9
	10	72.7	82.8	41.0	78.0	77.0	76.0	75.0	74.0	72.0	63.0	58.0	51.0	72.7	0.0	72.7
	11	72.4	88.1	43.1	77.0	76.0	76.0	75.0	73.0	71.0	62.0	57.0	48.0	72.4	0.0	72.4
	12	72.7	90.0	46.6	77.0	77.0	76.0	75.0	74.0	71.0	63.0	59.0	53.0	72.7	0.0	72.7
	13	72.8	95.0	48.9	78.0	77.0	76.0	75.0	74.0	71.0	62.0	57.0	51.0	72.8	0.0	72.8
	14	72.6	89.5	45.7	78.0	77.0	76.0	75.0	74.0	71.0	62.0	57.0	52.0	72.6	0.0	72.6
	15	72.9	90.2	43.5	78.0	77.0	76.0	76.0	74.0	72.0	64.0	58.0	51.0	72.9	0.0	72.9
	16	73.1	89.4	47.9	78.0	77.0	76.0	76.0	74.0	72.0	65.0	60.0	51.0	73.1	0.0	73.1
	17	73.0	96.1	47.7	78.0	77.0	76.0	75.0	74.0	71.0	64.0	60.0	52.0	73.0	0.0	73.0
	18	73.1	91.1	43.3	79.0	77.0	76.0	76.0	74.0	72.0	62.0	57.0	47.0	73.1	0.0	73.1
Evening	19	72.1	82.9	43.5	78.0	77.0	76.0	75.0	73.0	71.0	57.0	51.0	46.0	72.1	5.0	77.1
	20	72.6	94.6	43.7	78.0	77.0	76.0	75.1	73.0	70.0	58.0	53.0	49.0	72.6	5.0	77.6
	21	71.4	90.3	41.8	78.0	77.0	75.0	75.0	72.0	69.0	53.0	48.0	44.0	71.4	5.0	76.4
Night	22	69.2	83.3	39.2	76.0	75.0	74.0	74.0	71.0	66.0	47.0	45.0	42.0	69.2	10.0	79.2
	23	67.9	89.5	36.2	77.0	75.0	73.0	72.0	68.0	60.0	41.0	39.0	36.0	67.9	10.0	77.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	72.4	82.8	41.0	77.0	76.0	76.0	75.0	73.0	71.0	60.0	54.0	45.0
	Max	73.7	96.1	48.9	79.0	78.0	77.0	76.0	75.0	73.0	65.0	60.0	53.0
Energy Average		72.9	Average:		77.9	77.0	76.1	75.5	74.0	71.7	62.7	57.5	49.7
Evening	Min	71.4	82.9	41.8	78.0	77.0	75.0	75.0	72.0	69.0	53.0	48.0	44.0
	Max	72.6	94.6	43.7	78.0	77.0	76.0	75.1	73.0	71.0	58.0	53.0	49.0
Energy Average		72.1	Average:		78.0	77.0	75.7	75.0	72.7	70.0	56.0	50.7	46.3
Night	Min	65.7	80.8	35.8	76.0	75.0	72.0	71.0	65.0	54.0	39.0	38.0	36.0
	Max	74.7	91.8	46.5	81.0	79.0	78.0	78.0	76.0	73.0	62.0	56.0	49.0
Energy Average		71.5	Average:		78.1	76.9	75.2	74.4	70.7	63.9	48.9	45.9	41.9

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
72.3	72.8	71.5

24-Hour CNEL (dBA)
78.4

24-Hour Noise Level Measurement Summary

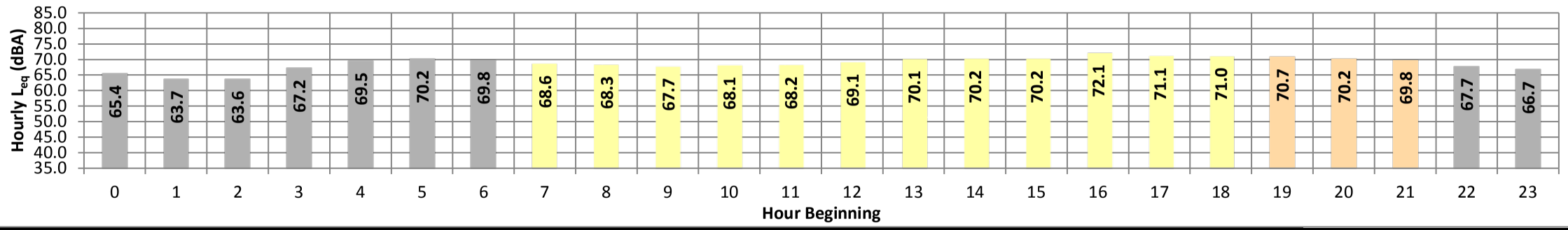
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L4 - Located west of the Project site across Winchester Road adjacent to existing residential homes.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	65.4	84.9	38.3	75.0	74.0	71.0	70.0	65.0	57.0	44.0	42.0	39.0	65.4	10.0	75.4
	1	63.7	82.5	37.4	74.0	73.0	71.0	69.0	62.0	51.0	39.0	38.0	37.0	63.7	10.0	73.7
	2	63.6	80.3	37.5	73.0	72.0	71.0	69.0	62.0	51.0	41.0	40.0	37.0	63.6	10.0	73.6
	3	67.2	79.7	42.4	76.0	75.0	73.0	72.0	67.0	62.0	49.0	47.0	44.0	67.2	10.0	77.2
	4	69.5	86.4	46.2	76.0	76.0	74.0	74.0	71.0	66.0	56.0	54.0	49.0	69.5	10.0	79.5
	5	70.2	87.0	46.8	78.0	76.0	75.0	74.0	71.0	66.0	55.0	53.0	49.0	70.2	10.0	80.2
	6	69.8	85.5	47.1	76.0	75.0	74.0	74.0	71.0	67.0	56.0	53.0	49.0	69.8	10.0	79.8
Day	7	68.6	83.8	45.1	75.0	74.0	73.0	72.0	70.0	66.0	55.0	52.0	47.0	68.6	0.0	68.6
	8	68.3	89.2	45.2	76.0	74.0	72.0	72.0	69.0	65.0	54.0	52.0	48.0	68.3	0.0	68.3
	9	67.7	83.4	46.6	75.0	74.0	72.0	72.0	69.0	65.0	55.0	52.0	49.0	67.7	0.0	67.7
	10	68.1	83.3	47.4	75.0	74.0	73.0	72.0	69.0	65.0	56.0	54.0	50.0	68.1	0.0	68.1
	11	68.2	82.6	46.0	74.0	73.0	72.0	72.0	69.0	66.0	55.0	52.0	48.0	68.2	0.0	68.2
	12	69.1	86.3	51.1	75.0	74.0	73.0	73.0	70.0	67.0	57.0	55.0	52.0	69.1	0.0	69.1
	13	70.1	95.1	46.6	76.0	75.0	73.0	73.0	70.0	67.0	57.0	55.0	52.0	70.1	0.0	70.1
	14	70.2	82.8	52.0	76.0	75.0	74.0	74.0	72.0	68.0	58.0	57.0	54.0	70.2	0.0	70.2
	15	70.2	81.3	51.8	76.0	75.0	74.0	73.0	71.0	69.0	58.0	56.0	53.0	70.2	0.0	70.2
	16	72.1	98.4	50.2	76.0	75.0	74.0	73.0	72.0	69.0	59.0	57.0	53.0	72.1	0.0	72.1
	17	71.1	86.2	46.2	77.0	76.0	75.0	74.0	72.0	70.0	60.0	56.0	50.0	71.1	0.0	71.1
	18	71.0	83.9	50.1	77.0	76.0	75.0	74.0	72.0	69.0	58.0	55.0	52.0	71.0	0.0	71.0
Evening	19	70.7	93.8	47.5	76.0	75.0	74.0	74.0	72.0	68.0	56.0	53.0	50.0	70.7	5.0	75.7
	20	70.2	88.6	46.4	76.0	75.0	74.0	74.0	71.0	68.0	55.0	52.0	48.0	70.2	5.0	75.2
	21	69.8	91.7	40.5	76.0	76.0	74.0	74.0	71.0	66.0	51.0	48.0	44.0	69.8	5.0	74.8
Night	22	67.7	85.7	41.5	75.0	74.0	73.0	72.0	69.0	62.0	49.0	46.0	43.0	67.7	10.0	77.7
	23	66.7	88.6	37.5	75.0	74.0	72.0	71.0	66.0	58.0	43.0	41.0	39.0	66.7	10.0	76.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	67.7	81.3	45.1	74.0	73.0	72.0	72.0	69.0	65.0	54.0	52.0	47.0
	Max	72.1	98.4	52.0	77.0	76.0	75.0	74.0	72.0	70.0	60.0	57.0	54.0
Energy Average		69.8	Average:		75.7	74.6	73.3	72.8	70.4	67.2	56.8	54.4	50.7
Evening	Min	69.8	88.6	40.5	76.0	75.0	74.0	74.0	71.0	66.0	51.0	48.0	44.0
	Max	70.7	93.8	47.5	76.0	76.0	74.0	74.0	72.0	68.0	56.0	53.0	50.0
Energy Average		70.2	Average:		76.0	75.3	74.0	74.0	71.3	67.3	54.0	51.0	47.3
Night	Min	63.6	79.7	37.4	73.0	72.0	71.0	69.0	62.0	51.0	39.0	38.0	37.0
	Max	70.2	88.6	47.1	78.0	76.0	75.0	74.0	71.0	67.0	56.0	54.0	49.0
Energy Average		67.7	Average:		75.3	74.3	72.7	71.7	67.1	60.0	48.0	46.0	42.9

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
69.2	69.9	67.7

24-Hour CNEL (dBA)

74.9

24-Hour Noise Level Measurement Summary

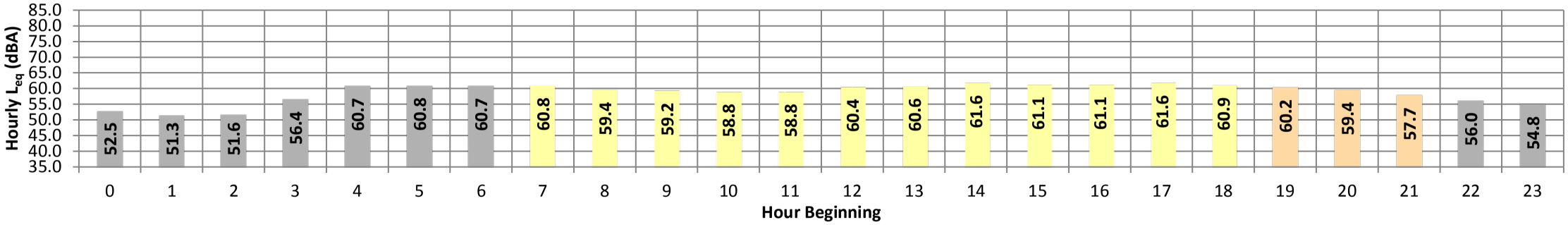
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L5 - Located southwest of the Project site on Augusta Drive adjacent to existing residential homes.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	52.5	67.1	35.5	60.0	59.0	58.0	57.0	53.0	49.0	39.0	38.0	37.0	52.5	10.0	62.5
	1	51.3	62.8	35.5	59.0	58.0	56.0	55.0	52.0	48.0	38.0	36.0	35.0	51.3	10.0	61.3
	2	51.6	64.9	35.5	59.0	58.0	56.0	55.0	53.0	49.0	39.0	37.0	35.0	51.6	10.0	61.6
	3	56.4	70.9	38.4	63.0	62.0	60.0	60.0	57.0	54.0	48.0	46.0	42.0	56.4	10.0	66.4
	4	60.7	71.5	46.5	66.0	65.0	64.0	64.0	61.0	59.0	54.0	53.0	50.0	60.7	10.0	70.7
	5	60.8	77.1	48.2	66.0	65.0	64.0	63.0	62.0	59.0	55.0	53.0	51.0	60.8	10.0	70.8
	6	60.7	75.5	45.4	67.0	65.0	64.0	63.0	61.0	59.0	54.0	52.0	48.0	60.7	10.0	70.7
Day	7	60.8	71.8	44.8	67.0	66.0	64.0	63.0	61.0	60.0	55.0	52.0	48.0	60.8	0.0	60.8
	8	59.4	76.3	44.5	65.0	64.0	62.0	61.0	60.0	58.0	53.0	52.0	47.0	59.4	0.0	59.4
	9	59.2	71.2	41.0	65.0	64.0	62.0	62.0	60.0	58.0	53.0	50.0	46.0	59.2	0.0	59.2
	10	58.8	70.2	42.3	65.0	64.0	62.0	61.0	59.0	57.0	51.0	49.0	45.0	58.8	0.0	58.8
	11	58.8	69.9	41.3	66.0	64.0	62.0	61.0	59.0	57.0	52.0	50.0	45.0	58.8	0.0	58.8
	12	60.4	76.1	43.3	66.0	65.0	63.0	62.0	61.0	59.0	54.0	53.0	49.0	60.4	0.0	60.4
	13	60.6	76.8	50.8	67.0	65.0	63.0	63.0	61.0	59.0	55.0	54.0	52.0	60.6	0.0	60.6
	14	61.6	75.4	49.7	67.0	66.0	64.0	64.0	62.0	60.0	56.0	54.0	52.0	61.6	0.0	61.6
	15	61.1	76.2	48.1	67.0	65.0	64.0	63.0	61.0	60.0	56.0	54.0	51.0	61.1	0.0	61.1
	16	61.1	78.6	45.4	67.0	66.0	64.0	63.0	61.0	60.0	56.0	54.0	51.0	61.1	0.0	61.1
	17	61.6	80.5	46.3	68.0	66.0	64.0	64.0	62.0	60.0	55.0	53.0	50.0	61.6	0.0	61.6
	18	60.9	69.6	45.0	66.0	65.0	64.0	63.0	62.0	60.0	55.0	54.0	50.0	60.9	0.0	60.9
Evening	19	60.2	72.7	42.9	66.0	65.0	63.0	63.0	61.0	59.0	54.0	52.0	49.0	60.2	5.0	65.2
	20	59.4	85.5	44.4	65.0	64.0	62.0	61.0	59.0	57.0	53.0	51.0	48.0	59.4	5.0	64.4
	21	57.7	76.4	38.5	64.0	63.0	61.0	60.0	58.0	56.0	48.0	46.0	41.0	57.7	5.0	62.7
Night	22	56.0	70.4	35.5	63.0	61.0	60.0	59.0	57.0	54.0	47.0	44.0	36.0	56.0	10.0	66.0
	23	54.8	71.2	35.5	63.0	61.0	59.0	58.0	55.0	52.0	43.0	40.0	38.0	54.8	10.0	64.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.8	69.6	41.0	65.0	64.0	62.0	61.0	59.0	57.0	51.0	49.0	45.0
	Max	61.6	80.5	50.8	68.0	66.0	64.0	64.0	62.0	60.0	56.0	54.0	52.0
Energy Average		60.5	Average:		66.3	65.0	63.2	62.5	60.8	59.0	54.3	52.4	48.8
Evening	Min	57.7	72.7	38.5	64.0	63.0	61.0	60.0	58.0	56.0	48.0	46.0	41.0
	Max	60.2	85.5	44.4	66.0	65.0	63.0	63.0	61.0	59.0	54.0	52.0	49.0
Energy Average		59.2	Average:		65.0	64.0	62.0	61.3	59.3	57.3	51.7	49.7	46.0
Night	Min	51.3	62.8	35.5	59.0	58.0	56.0	55.0	52.0	48.0	38.0	36.0	35.0
	Max	60.8	77.1	48.2	67.0	65.0	64.0	64.0	62.0	59.0	55.0	53.0	51.0
Energy Average		57.6	Average:		62.9	61.6	60.1	59.3	56.8	53.7	46.3	44.3	41.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
59.4	60.2	57.6

24-Hour CNEL (dBA)
64.8

24-Hour Noise Level Measurement Summary

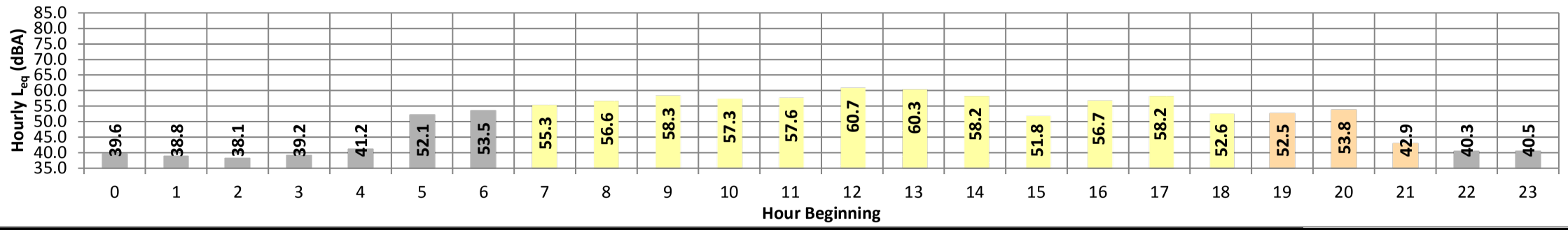
Date: Wednesday, July 11, 2018
Project: KTM French Valley

Location: L6 - Located south of the Project site adjacent to a vacant lot designated as future commercial land use.

Meter: Piccolo I

JN: 11624
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	39.6	57.8	38.2	42.0	41.0	41.0	40.0	39.0	38.0	38.0	38.0	38.0	39.6	10.0	49.6
	1	38.8	47.9	35.4	46.0	44.0	41.0	40.0	38.0	38.0	35.0	35.0	35.0	38.8	10.0	48.8
	2	38.1	47.9	35.4	43.0	41.0	40.0	40.0	38.0	38.0	35.0	35.0	35.0	38.1	10.0	48.1
	3	39.2	47.7	35.4	43.0	42.0	41.0	41.0	40.0	38.0	38.0	38.0	36.0	39.2	10.0	49.2
	4	41.2	49.4	38.3	44.0	44.0	43.0	42.0	41.0	40.0	40.0	40.0	38.0	41.2	10.0	51.2
	5	52.1	79.3	40.1	60.0	51.0	48.0	46.0	44.0	43.0	41.0	41.0	40.0	52.1	10.0	62.1
	6	53.5	78.0	39.6	66.0	59.0	53.0	50.0	44.0	43.0	41.0	40.0	40.0	53.5	10.0	63.5
Day	7	55.3	75.8	38.3	67.0	63.0	59.0	57.0	46.0	42.0	40.0	40.0	38.0	55.3	0.0	55.3
	8	56.6	76.7	38.3	69.0	67.0	63.0	58.0	49.0	45.0	41.0	40.0	38.0	56.6	0.0	56.6
	9	58.3	74.7	38.3	71.0	69.0	64.0	61.0	55.0	50.0	43.0	41.0	39.0	58.3	0.0	58.3
	10	57.3	76.9	42.2	68.0	66.0	63.0	60.0	54.0	51.0	46.0	45.0	43.0	57.3	0.0	57.3
	11	57.6	76.7	38.4	70.0	68.0	64.0	61.0	51.0	46.0	41.0	40.0	39.0	57.6	0.0	57.6
	12	60.7	84.4	40.0	73.0	70.0	65.0	61.0	50.0	45.0	41.0	41.0	40.0	60.7	0.0	60.7
	13	60.3	82.8	40.1	75.0	69.0	64.0	61.0	48.0	44.0	42.0	41.0	41.0	60.3	0.0	60.3
	14	58.2	76.1	42.0	71.0	69.0	65.0	61.0	51.0	47.0	44.0	43.0	42.0	58.2	0.0	58.2
	15	51.8	69.5	41.3	65.0	61.0	56.0	52.0	47.0	45.0	43.0	42.0	42.0	51.8	0.0	51.8
	16	56.7	79.5	41.2	71.0	66.0	58.0	53.0	46.0	44.0	42.0	42.0	41.0	56.7	0.0	56.7
	17	58.2	75.1	40.1	71.0	69.0	66.0	60.0	48.0	44.0	42.0	41.0	41.0	58.2	0.0	58.2
	18	52.6	72.6	41.2	66.0	62.0	56.0	53.0	47.0	45.0	43.0	42.0	41.0	52.6	0.0	52.6
Evening	19	52.5	73.6	41.2	66.0	60.0	54.0	50.0	45.0	44.0	42.0	42.0	41.0	52.5	5.0	57.5
	20	53.8	78.9	38.4	67.0	60.0	49.0	46.0	43.0	42.0	40.0	40.0	40.0	53.8	5.0	58.8
	21	42.9	61.5	38.3	51.0	49.0	47.0	46.0	42.0	40.0	38.0	38.0	38.0	42.9	5.0	47.9
Night	22	40.3	60.1	38.0	48.0	44.0	41.0	41.0	39.0	38.0	38.0	38.0	38.0	40.3	10.0	50.3
	23	40.5	62.3	38.0	46.0	43.0	41.0	41.0	39.0	38.0	38.0	38.0	38.0	40.5	10.0	50.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.8	69.5	38.3	65.0	61.0	56.0	52.0	46.0	42.0	40.0	40.0	38.0
	Max	60.7	84.4	42.2	75.0	70.0	66.0	61.0	55.0	51.0	46.0	45.0	43.0
Energy Average		57.6	Average:		69.8	66.6	61.9	58.2	49.3	45.7	42.3	41.5	40.4
Evening	Min	42.9	61.5	38.3	51.0	49.0	47.0	46.0	42.0	40.0	38.0	38.0	38.0
	Max	53.8	78.9	41.2	67.0	60.0	54.0	50.0	45.0	44.0	42.0	42.0	41.0
Energy Average		51.6	Average:		61.3	56.3	50.0	47.3	43.3	42.0	40.0	40.0	39.7
Night	Min	38.1	47.7	35.4	42.0	41.0	40.0	40.0	38.0	38.0	35.0	35.0	35.0
	Max	53.5	79.3	40.1	66.0	59.0	53.0	50.0	44.0	43.0	41.0	41.0	40.0
Energy Average		47.0	Average:		48.7	45.4	43.2	42.3	40.2	39.3	38.2	38.1	37.6

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
55.1	56.9	47.0

24-Hour CNEL (dBA)
57.3

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,936	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,594	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	3.85	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.37	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.79	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.0	68.7	67.4	63.3	71.0	71.5
Medium Trucks:	57.4	55.1	50.1	51.7	58.6	58.8
Heavy Trucks:	66.0	64.1	58.9	58.6	66.1	66.3
Vehicle Noise:	72.3	70.2	68.0	64.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	133	286	616	1,326
CNEL:	141	304	655	1,412

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	49,249	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,925	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.15	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.07	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.49	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.0	67.7	63.6	71.3	71.8
Medium Trucks:	57.7	55.4	50.4	52.0	58.9	59.1
Heavy Trucks:	66.3	64.4	59.2	58.9	66.4	66.6
Vehicle Noise:	72.6	70.5	68.3	65.1	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	299	645	1,389
CNEL:	148	319	687	1,479

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	52,549	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,255	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.43	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.79	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.21	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.3	67.9	63.9	71.6	72.0
Medium Trucks:	58.0	55.7	50.7	52.2	59.2	59.3
Heavy Trucks:	66.6	64.7	59.5	59.1	66.7	66.9
Vehicle Noise:	72.9	70.7	68.6	65.4	73.0	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	145	313	673	1,451
CNEL:	154	333	717	1,545

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	58,712	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,871	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.92	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.30	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.72	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.1	69.8	68.4	64.4	72.0	72.5
Medium Trucks:	58.5	56.1	51.2	52.7	59.7	59.8
Heavy Trucks:	67.0	65.2	59.9	59.6	67.2	67.4
Vehicle Noise:	73.4	71.2	69.1	65.9	73.4	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	156	337	725	1,562
CNEL:	166	358	772	1,663

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Technology Dr.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	56,612 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,661 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.76	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.46	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.88	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.9	69.6	68.3	64.2	71.9	72.4
Medium Trucks:	58.3	56.0	51.0	52.6	59.5	59.7
Heavy Trucks:	66.9	65.0	59.8	59.5	67.0	67.2
Vehicle Noise:	73.2	71.1	68.9	65.7	73.3	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	708	1,525
CNEL:	162	350	753	1,623

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Murrieta Hot Springs Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	49,372 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,937 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.16	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.06	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.48	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.1	67.7	63.7	71.3	71.8
Medium Trucks:	57.7	55.4	50.4	52.0	58.9	59.1
Heavy Trucks:	66.3	64.4	59.2	58.9	66.4	66.6
Vehicle Noise:	72.6	70.5	68.3	65.1	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	300	646	1,392
CNEL:	148	319	688	1,482

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Auld Rd.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,881 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	788 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.42	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-26.64	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.06	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.2	61.0	59.6	55.6	63.2	63.7
Medium Trucks:	50.2	47.9	42.9	44.5	51.4	51.6
Heavy Trucks:	60.1	58.2	53.0	52.7	60.2	60.4
Vehicle Noise:	65.1	62.9	60.5	57.6	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	110	237
CNEL:	25	54	117	252

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Sparkman Wy.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,186 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	119 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-10.65	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-34.87	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-30.29	3.32	-1.20	-5.77	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:	57.9	55.7	54.3	50.3	57.9	58.4
Medium Trucks:	45.0	42.7	37.7	39.2	46.2	46.3
Heavy Trucks:	54.8	52.9	47.7	47.4	55.0	55.2
Vehicle Noise:	59.8	57.7	55.2	52.3	59.9	60.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	14	29	63
CNEL:	7	15	31	67

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Robert Trent Jones Pkwy.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,381 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	338 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-6.10	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-30.32	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.74	3.32	-1.20	-5.77	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:	62.5	60.2	58.8	54.8	62.5	62.9
Medium Trucks:	49.5	47.2	42.2	43.8	50.7	50.9
Heavy Trucks:	59.4	57.5	52.3	52.0	59.5	59.7
Vehicle Noise:	64.4	62.2	59.8	56.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	27	59	128
CNEL:	14	29	63	135

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Murrieta Hot Springs Rd.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,209 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,021 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.14	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-20.08	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.50	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:	73.3	71.0	69.6	65.6	73.3	73.8
Medium Trucks:	60.1	57.8	52.8	54.4	61.3	61.5
Heavy Trucks:	69.5	67.6	62.4	62.1	69.6	69.8
Vehicle Noise:	74.9	72.8	70.5	67.4	75.0	75.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	172	371	799
CNEL:	85	183	394	849

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,521 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,652 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	3.90	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.37	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.77	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.0	68.8	67.4	63.4	71.0	71.5
Medium Trucks:	57.4	55.1	50.1	51.7	58.6	58.8
Heavy Trucks:	66.0	64.1	58.9	58.6	66.1	66.3
Vehicle Noise:	72.4	70.2	68.0	64.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	134	288	620	1,335
CNEL:	142	306	660	1,422

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	49,834 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,983 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.20	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.07	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.47	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.1	67.7	63.7	71.3	71.8
Medium Trucks:	57.7	55.4	50.4	52.0	58.9	59.1
Heavy Trucks:	66.3	64.4	59.2	58.9	66.4	66.6
Vehicle Noise:	72.7	70.5	68.3	65.1	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	140	301	649	1,398
CNEL:	149	321	691	1,489

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,214 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,321 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.49	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.74	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.15	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.6	69.4	68.0	64.0	71.6	72.1
Medium Trucks:	58.0	55.7	50.7	52.3	59.2	59.4
Heavy Trucks:	66.6	64.7	59.5	59.2	66.7	67.0
Vehicle Noise:	73.0	70.8	68.6	65.4	73.0	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	146	315	679	1,463
CNEL:	156	336	723	1,557

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,523 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,952 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.97	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.27	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.68	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.1	69.9	68.5	64.5	72.1	72.6
Medium Trucks:	58.5	56.2	51.2	52.8	59.7	59.9
Heavy Trucks:	67.1	65.2	60.0	59.7	67.2	67.4
Vehicle Noise:	73.4	71.3	69.1	65.9	73.5	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	158	339	731	1,576
CNEL:	168	361	779	1,678

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Technology Dr.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	57,350 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,735 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.81	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.42	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.83	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.0	69.7	68.3	64.3	71.9	72.4
Medium Trucks:	58.3	56.0	51.1	52.6	59.5	59.7
Heavy Trucks:	66.9	65.0	59.8	59.5	67.1	67.3
Vehicle Noise:	73.3	71.1	69.0	65.8	73.3	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	154	331	714	1,537
CNEL:	164	353	760	1,637

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Murrieta Hot Springs Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	49,666 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,967 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.19	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.06	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.46	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.3	69.1	67.7	63.7	71.3	71.8
Medium Trucks:	57.7	55.4	50.4	52.0	58.9	59.1
Heavy Trucks:	66.3	64.4	59.2	58.9	66.4	66.6
Vehicle Noise:	72.7	70.5	68.3	65.1	72.7	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	140	301	648	1,397
CNEL:	149	320	690	1,487

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Auld Rd.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,954 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	795 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.38	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-26.64	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-22.06	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.2	61.0	59.6	55.6	63.2	63.7
Medium Trucks:	50.2	47.9	42.9	44.5	51.4	51.6
Heavy Trucks:	60.1	58.2	53.0	52.7	60.2	60.4
Vehicle Noise:	65.1	63.0	60.5	57.6	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	111	238
CNEL:	25	54	117	253

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Sparkman Wy.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,853 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	185 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.48%
Medium Trucks:	70.4%	5.6%	24.0%	0.35%
Heavy Trucks:	77.8%	5.9%	16.3%	1.17%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.71	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-33.25	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-27.96	3.32	-1.20	-5.77	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:	59.9	57.6	56.2	52.2	59.8	60.3
Medium Trucks:	46.6	44.3	39.3	40.9	47.8	48.0
Heavy Trucks:	57.2	55.3	50.1	49.7	57.3	57.5
Vehicle Noise:	61.9	59.7	57.2	54.4	61.9	62.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	40	87
CNEL:	9	20	43	92

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Robert Trent Jones Pkwy.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,454 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	345 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.59%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.05%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-6.00	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-30.32	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.74	3.32	-1.20	-5.77	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:	62.6	60.3	58.9	54.9	62.6	63.0
Medium Trucks:	49.5	47.2	42.2	43.8	50.7	50.9
Heavy Trucks:	59.4	57.5	52.3	52.0	59.5	59.7
Vehicle Noise:	64.4	62.3	59.9	56.9	64.5	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	60	129
CNEL:	14	29	63	137

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Murrieta Hot Springs Rd.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	40,652 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,065 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.19	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-20.05	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.45	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:	73.3	71.1	69.7	65.7	73.3	73.8
Medium Trucks:	60.1	57.8	52.8	54.4	61.3	61.5
Heavy Trucks:	69.5	67.6	62.4	62.1	69.7	69.9
Vehicle Noise:	75.0	72.8	70.5	67.5	75.1	75.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	173	374	805
CNEL:	85	184	397	855

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,792	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,779	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	4.02	-3.44	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-20.20	-3.43	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-15.62	-3.43	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.2	68.9	67.5	63.5	71.1	71.6
Medium Trucks:	57.6	55.3	50.3	51.8	58.8	58.9
Heavy Trucks:	66.1	64.3	59.1	58.7	66.3	66.5
Vehicle Noise:	72.5	70.3	68.2	65.0	72.6	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	136	293	632	1,362
CNEL:	145	312	673	1,450

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,239	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,124	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	4.32	-3.44	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-19.90	-3.43	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-15.32	-3.43	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.5	69.2	67.8	63.8	71.4	71.9
Medium Trucks:	57.9	55.6	50.6	52.1	59.1	59.2
Heavy Trucks:	66.4	64.6	59.4	59.0	66.6	66.8
Vehicle Noise:	72.8	70.6	68.5	65.3	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	143	307	662	1,427
CNEL:	152	327	705	1,519

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	54,672	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,467	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	4.61	-3.44	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-19.61	-3.43	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-15.03	-3.43	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.7	69.5	68.1	64.1	71.7	72.2
Medium Trucks:	58.2	55.8	50.9	52.4	59.3	59.5
Heavy Trucks:	66.7	64.8	59.6	59.3	66.9	67.1
Vehicle Noise:	73.1	70.9	68.8	65.6	73.1	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	149	321	691	1,490
CNEL:	159	342	736	1,586

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	61,084	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	6,108	vehicles
Vehicle Speed:	55	mph
Near/Far Lane Distance:	78	feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	5.09	-3.44	-1.20	*-4.76*	0.000	0.000
Medium Trucks:	82.40	-19.13	-3.43	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-14.55	-3.43	-1.20	*-5.18*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.2	70.0	68.6	64.6	72.2	72.7
Medium Trucks:	58.6	56.3	51.4	52.9	59.8	60.0
Heavy Trucks:	67.2	65.3	60.1	59.8	67.3	67.6
Vehicle Noise:	73.6	71.4	69.2	66.0	73.6	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	160	346	744	1,604
CNEL:	171	368	793	1,708

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project | Project Name: KTM
Road Name: Winchester Rd. (SR-79) | Job Number: 11624
Road Segment: s/o Technology Dr.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	58,899 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,890 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.93	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.29	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.71	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.1	69.8	68.4	64.4	72.1	72.5
Medium Trucks:	58.5	56.2	51.2	52.7	59.7	59.8
Heavy Trucks:	67.1	65.2	60.0	59.6	67.2	67.4
Vehicle Noise:	73.4	71.2	69.1	65.9	73.5	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	157	337	727	1,565
CNEL:	167	359	774	1,667

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project | Project Name: KTM
Road Name: Winchester Rd. (SR-79) | Job Number: 11624
Road Segment: s/o Murrieta Hot Springs Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,367 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,137 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.33	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.89	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.30	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.5	69.2	67.8	63.8	71.5	71.9
Medium Trucks:	57.9	55.6	50.6	52.1	59.1	59.2
Heavy Trucks:	66.5	64.6	59.4	59.0	66.6	66.8
Vehicle Noise:	72.8	70.6	68.5	65.3	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	143	308	663	1,429
CNEL:	152	328	706	1,521

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project | Project Name: KTM
Road Name: Auld Rd. | Job Number: 11624
Road Segment: e/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,199 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	820 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.25	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-26.47	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.89	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.1	59.7	55.7	63.4	63.8
Medium Trucks:	50.4	48.1	43.1	44.6	51.6	51.7
Heavy Trucks:	60.2	58.4	53.1	52.8	60.4	60.6
Vehicle Noise:	65.2	63.1	60.7	57.7	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	113	243
CNEL:	26	56	120	258

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project | Project Name: KTM
Road Name: Sparkman Wy. | Job Number: 11624
Road Segment: e/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,234 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	123 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-10.48	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-34.70	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-30.11	3.32	-1.20	-5.77	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:	58.1	55.9	54.5	50.5	58.1	58.6
Medium Trucks:	45.1	42.8	37.9	39.4	46.3	46.5
Heavy Trucks:	55.0	53.1	47.9	47.6	55.1	55.3
Vehicle Noise:	60.0	57.8	55.4	52.5	60.1	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	7	14	30	65
CNEL:	7	15	32	69

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Robert Trent Jones Pkwy.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,518 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	352 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.93	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-30.15	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.57	3.32	-1.20	-5.77	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:	62.7	60.4	59.0	55.0	62.6	63.1
Medium Trucks:	49.7	47.4	42.4	44.0	50.9	51.1
Heavy Trucks:	59.6	57.7	52.5	52.1	59.7	59.9
Vehicle Noise:	64.5	62.4	60.0	57.0	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	61	131
CNEL:	14	30	65	139

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 Without Project
Road Name: Murrieta Hot Springs Rd.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,834 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,183 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.31	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-19.91	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.32	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:	73.5	71.2	69.8	65.8	73.4	73.9
Medium Trucks:	60.3	58.0	53.0	54.5	61.5	61.6
Heavy Trucks:	69.7	67.8	62.6	62.2	69.8	70.0
Vehicle Noise:	75.1	73.0	70.6	67.6	75.2	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	82	177	381	820
CNEL:	87	188	405	871

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,377 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,838 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.07	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-20.20	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.60	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.2	69.0	67.6	63.6	71.2	71.7
Medium Trucks:	57.6	55.3	50.3	51.8	58.8	58.9
Heavy Trucks:	66.2	64.3	59.1	58.8	66.3	66.5
Vehicle Noise:	72.5	70.4	68.2	65.0	72.6	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	137	295	636	1,371
CNEL:	146	314	677	1,460

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,824 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,182 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.37	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.90	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.30	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.5	69.3	67.9	63.9	71.5	72.0
Medium Trucks:	57.9	55.6	50.6	52.1	59.1	59.2
Heavy Trucks:	66.5	64.6	59.4	59.1	66.6	66.8
Vehicle Noise:	72.8	70.7	68.5	65.3	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	144	309	666	1,435
CNEL:	153	329	709	1,528

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	55,337 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,534 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.66	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.57	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.98	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.8	69.6	68.2	64.2	71.8	72.3
Medium Trucks:	58.2	55.9	50.9	52.5	59.4	59.6
Heavy Trucks:	66.8	64.9	59.7	59.4	66.9	67.1
Vehicle Noise:	73.1	71.0	68.8	65.6	73.2	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	150	324	697	1,502
CNEL:	160	344	742	1,599

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	61,895 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,189 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.14	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.09	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.51	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.3	70.0	68.6	64.6	72.3	72.8
Medium Trucks:	58.7	56.4	51.4	52.9	59.9	60.0
Heavy Trucks:	67.3	65.4	60.2	59.8	67.4	67.6
Vehicle Noise:	73.6	71.5	69.3	66.1	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	162	348	751	1,617
CNEL:	172	371	799	1,722

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Technology Dr.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,637 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,964 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.98	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.25	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.66	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.1	69.9	68.5	64.5	72.1	72.6
Medium Trucks:	58.5	56.2	51.2	52.8	59.7	59.9
Heavy Trucks:	67.1	65.2	60.0	59.7	67.2	67.4
Vehicle Noise:	73.5	71.3	69.1	65.9	73.5	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	158	340	732	1,578
CNEL:	168	362	780	1,680

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Murrieta Hot Springs Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,661 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,166 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.36	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.89	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.29	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.5	69.3	67.9	63.9	71.5	72.0
Medium Trucks:	57.9	55.6	50.6	52.1	59.1	59.2
Heavy Trucks:	66.5	64.6	59.4	59.1	66.6	66.8
Vehicle Noise:	72.8	70.7	68.5	65.3	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	143	309	665	1,434
CNEL:	153	329	709	1,526

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project | Project Name: KTM
Road Name: Auld Rd. | Job Number: 11624
Road Segment: e/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,272 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	827 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.21	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-26.47	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.89	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.2	59.8	55.8	63.4	63.9
Medium Trucks:	50.4	48.1	43.1	44.6	51.6	51.7
Heavy Trucks:	60.2	58.4	53.1	52.8	60.4	60.6
Vehicle Noise:	65.3	63.1	60.7	57.8	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	53	113	244
CNEL:	26	56	120	259

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project | Project Name: KTM
Road Name: Sparkman Wy. | Job Number: 11624
Road Segment: e/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,901 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	190 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.48%
Medium Trucks:	70.4%	5.6%	24.0%	0.35%
Heavy Trucks:	77.8%	5.9%	16.3%	1.17%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.60	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-33.13	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-27.86	3.32	-1.20	-5.77	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:	60.0	57.7	56.3	52.3	60.0	60.4
Medium Trucks:	46.7	44.4	39.4	41.0	47.9	48.1
Heavy Trucks:	57.3	55.4	50.2	49.8	57.4	57.6
Vehicle Noise:	62.0	59.8	57.3	54.5	62.0	62.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	41	88
CNEL:	9	20	44	94

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project | Project Name: KTM
Road Name: Robert Trent Jones Pkwy. | Job Number: 11624
Road Segment: w/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,591 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	359 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.59%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.05%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.84	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-30.15	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.57	3.32	-1.20	-5.77	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:	62.7	60.5	59.1	55.1	62.7	63.2
Medium Trucks:	49.7	47.4	42.4	44.0	50.9	51.1
Heavy Trucks:	59.6	57.7	52.5	52.1	59.7	59.9
Vehicle Noise:	64.6	62.5	60.0	57.1	64.7	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	28	61	132
CNEL:	14	30	65	140

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA 2020 With Project | Project Name: KTM
Road Name: Murrieta Hot Springs Rd. | Job Number: 11624
Road Segment: w/o Winchester Rd. (SR-79)

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,277 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,228 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.36	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-19.88	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.28	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:	73.5	71.3	69.9	65.9	73.5	74.0
Medium Trucks:	60.3	58.0	53.0	54.6	61.5	61.7
Heavy Trucks:	69.7	67.8	62.6	62.3	69.8	70.0
Vehicle Noise:	75.2	73.0	70.7	67.7	75.2	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	383	826
CNEL:	88	189	407	878

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	63,678 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,368 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.27	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.95	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.37	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.4	70.2	68.8	64.8	72.4	72.9
Medium Trucks:	58.8	56.5	51.5	53.1	60.0	60.2
Heavy Trucks:	67.4	65.5	60.3	60.0	67.5	67.7
Vehicle Noise:	73.7	71.6	69.4	66.2	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	165	355	765	1,649
CNEL:	176	378	815	1,756

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	60,092 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,009 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.02	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.20	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.62	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.2	69.9	68.5	64.5	72.1	72.6
Medium Trucks:	58.6	56.3	51.3	52.8	59.8	59.9
Heavy Trucks:	67.1	65.3	60.0	59.7	67.3	67.5
Vehicle Noise:	73.5	71.3	69.2	66.0	73.5	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	159	342	736	1,587
CNEL:	169	364	784	1,689

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	67,494 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,749 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.52	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.70	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.12	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.7	70.4	69.0	65.0	72.6	73.1
Medium Trucks:	59.1	56.8	51.8	53.3	60.3	60.4
Heavy Trucks:	67.6	65.8	60.6	60.2	67.8	68.0
Vehicle Noise:	74.0	71.8	69.7	66.5	74.1	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	171	369	796	1,714
CNEL:	183	393	847	1,825

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	73,356 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,336 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.88	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.34	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.76	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.0	70.8	69.4	65.4	73.0	73.5
Medium Trucks:	59.4	57.1	52.2	53.7	60.6	60.8
Heavy Trucks:	68.0	66.1	60.9	60.6	68.1	68.3
Vehicle Noise:	74.4	72.2	70.0	66.8	74.4	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	181	390	841	1,812
CNEL:	193	416	895	1,929

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Technology Dr.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	70,151 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,015 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.69	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.53	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.95	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.8	70.6	69.2	65.2	72.8	73.3
Medium Trucks:	59.2	56.9	52.0	53.5	60.4	60.6
Heavy Trucks:	67.8	65.9	60.7	60.4	67.9	68.2
Vehicle Noise:	74.2	72.0	69.8	66.6	74.2	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	176	379	816	1,759
CNEL:	187	403	869	1,873

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Murrieta Hot Springs Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	56,277 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,628 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.73	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.49	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.91	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.9	69.6	68.2	64.2	71.9	72.3
Medium Trucks:	58.3	56.0	51.0	52.5	59.5	59.6
Heavy Trucks:	66.9	65.0	59.8	59.4	67.0	67.2
Vehicle Noise:	73.2	71.0	68.9	65.7	73.3	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	327	705	1,519
CNEL:	162	348	750	1,617

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Auld Rd.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,144 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,714 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.95	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-23.27	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.69	0.34	-1.20	-5.43	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:	66.6	64.3	62.9	58.9	66.6	67.0
Medium Trucks:	53.6	51.3	46.3	47.8	54.8	54.9
Heavy Trucks:	63.4	61.6	56.4	56.0	63.6	63.8
Vehicle Noise:	68.4	66.3	63.9	60.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	185	398
CNEL:	42	91	196	422

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Sparkman Wy.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,952 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	595 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.64	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-27.86	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.28	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.9	62.7	61.3	57.3	64.9	65.4
Medium Trucks:	52.0	49.7	44.7	46.2	53.2	53.3
Heavy Trucks:	61.8	60.0	54.7	54.4	62.0	62.2
Vehicle Noise:	66.8	64.7	62.2	59.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	86	186
CNEL:	20	43	92	197

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Robert Trent Jones Pkwy.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,206 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	421 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.15	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-29.37	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.79	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.4	61.2	59.8	55.8	63.4	63.9
Medium Trucks:	50.5	48.2	43.2	44.7	51.7	51.8
Heavy Trucks:	60.3	58.4	53.2	52.9	60.5	60.7
Vehicle Noise:	65.3	63.2	60.7	57.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	69	148
CNEL:	16	34	73	157

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 Without Project
Road Name: Murrieta Hot Springs Rd.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,220 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,822 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.93	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-19.29	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-14.71	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:	74.1	71.8	70.4	66.4	74.1	74.5
Medium Trucks:	60.9	58.6	53.6	55.1	62.1	62.2
Heavy Trucks:	70.3	68.4	63.2	62.9	70.4	70.6
Vehicle Noise:	75.7	73.6	71.3	68.2	75.8	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	90	194	419	902
CNEL:	96	206	445	958

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: n/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	64,263 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,426 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.31	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.95	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.36	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.4	70.2	68.8	64.8	72.4	72.9
Medium Trucks:	58.8	56.5	51.5	53.1	60.0	60.2
Heavy Trucks:	67.4	65.5	60.3	60.0	67.5	67.7
Vehicle Noise:	73.8	71.6	69.5	66.3	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	166	357	769	1,657
CNEL:	176	380	819	1,764

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Auld Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	60,677 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,068 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.57%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.06%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.06	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.20	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.61	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.2	70.0	68.6	64.6	72.2	72.7
Medium Trucks:	58.6	56.3	51.3	52.8	59.8	59.9
Heavy Trucks:	67.2	65.3	60.1	59.7	67.3	67.5
Vehicle Noise:	73.5	71.4	69.2	66.0	73.6	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	159	344	740	1,595
CNEL:	170	366	788	1,698

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Sparkman Wy.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	68,159 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	6,816 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.56	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.66	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.08	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.7	70.5	69.1	65.1	72.7	73.2
Medium Trucks:	59.1	56.8	51.8	53.4	60.3	60.5
Heavy Trucks:	67.7	65.8	60.6	60.3	67.8	68.0
Vehicle Noise:	74.0	71.9	69.7	66.5	74.1	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	173	372	801	1,725
CNEL:	184	396	853	1,837

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Hunter Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	74,167 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,417 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.93	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.31	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.72	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	73.1	70.8	69.4	65.4	73.1	73.5
Medium Trucks:	59.5	57.1	52.2	53.7	60.7	60.8
Heavy Trucks:	68.0	66.2	61.0	60.6	68.2	68.4
Vehicle Noise:	74.4	72.2	70.1	66.9	74.5	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	182	393	847	1,825
CNEL:	194	419	902	1,943

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Technology Dr.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	70,889 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	7,089 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	5.73	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-18.50	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-13.91	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.9	70.6	69.2	65.2	72.9	73.3
Medium Trucks:	59.3	57.0	52.0	53.5	60.5	60.6
Heavy Trucks:	67.9	66.0	60.8	60.4	68.0	68.2
Vehicle Noise:	74.2	72.0	69.9	66.7	74.3	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	177	382	822	1,771
CNEL:	189	406	875	1,885

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Winchester Rd. (SR-79)
Road Segment: s/o Murrieta Hot Springs Rd.
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	56,571 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,657 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	78 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	83.475
Medium Trucks:	83.368
Heavy Trucks:	83.379

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	4.75	-3.44	-1.20	-4.76	0.000	0.000
Medium Trucks:	82.40	-19.49	-3.43	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.89	-3.43	-1.20	-5.18	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.9	69.6	68.3	64.2	71.9	72.4
Medium Trucks:	58.3	56.0	51.0	52.5	59.5	59.6
Heavy Trucks:	66.9	65.0	59.8	59.5	67.0	67.2
Vehicle Noise:	73.2	71.1	68.9	65.7	73.3	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	707	1,523
CNEL:	162	349	753	1,622

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Auld Rd.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,217 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,722 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.97	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-23.27	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.69	0.34	-1.20	-5.43	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:	66.6	64.3	63.0	58.9	66.6	67.1
Medium Trucks:	53.6	51.3	46.3	47.8	54.8	54.9
Heavy Trucks:	63.4	61.6	56.4	56.0	63.6	63.8
Vehicle Noise:	68.5	66.3	63.9	61.0	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	185	399
CNEL:	42	91	196	423

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Sparkman Wy.
Road Segment: e/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,619 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	662 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.54%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.10%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.18	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-27.49	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.71	3.32	-1.20	-5.77	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:	65.4	63.1	61.8	57.7	65.4	65.9
Medium Trucks:	52.4	50.0	45.1	46.6	53.5	53.7
Heavy Trucks:	62.4	60.5	55.3	55.0	62.5	62.8
Vehicle Noise:	67.3	65.2	62.7	59.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	93	201
CNEL:	21	46	99	213

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Robert Trent Jones Pkwy.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,279 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	428 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:	30.0 feet
Centerline Dist. to Observer:	30.0 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:	71.5%	13.0%	15.5%	98.58%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.05%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	29.816
Medium Trucks:	29.518
Heavy Trucks:	29.547

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.07	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-29.37	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.79	3.32	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.3	59.9	55.9	63.5	64.0
Medium Trucks:	50.5	48.2	43.2	44.7	51.7	51.8
Heavy Trucks:	60.3	58.4	53.2	52.9	60.5	60.7
Vehicle Noise:	65.4	63.2	60.8	57.9	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	32	69	149
CNEL:	16	34	73	158

Tuesday, August 14, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC 2020 With Project
Road Name: Murrieta Hot Springs Rd.
Road Segment: w/o Winchester Rd. (SR-79)
Project Name: KTM
Job Number: 11624

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,663 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,866 vehicles
Vehicle Speed:	45 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:	71.5%	13.0%	15.5%	98.56%
Medium Trucks:	70.4%	5.6%	24.0%	0.37%
Heavy Trucks:	77.8%	5.9%	16.3%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	4.97	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	79.45	-19.26	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-14.67	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:	74.1	71.9	70.5	66.5	74.1	74.6
Medium Trucks:	60.9	58.6	53.6	55.2	62.1	62.3
Heavy Trucks:	70.3	68.4	63.2	62.9	70.4	70.7
Vehicle Noise:	75.8	73.6	71.3	68.3	75.8	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	91	195	421	907
CNEL:	96	208	447	964

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APPENDIX 9.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

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

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	276.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	266.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	276.0	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8
Shielding (Barrier Attenuation)	266.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		37.5	34.7	36.4	37.7	38.0	38.5
39 Minute Hourly Adjustment		**35.6**	**32.8**	**34.5**	**35.8**	**36.1**	**36.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

Observer Location: **R1**
Source: Pressure Washer
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	901.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	891.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	82.4	82.2	82.9	83.7	83.9	84.1
Distance Attenuation	901.0	-39.1	-39.1	-39.1	-39.1	-39.1	-39.1
Shielding (Barrier Attenuation)	891.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		37.8	37.6	38.3	39.1	39.3	39.5
30 Minute Hourly Adjustment		**34.8**	**34.6**	**35.3**	**36.1**	**36.3**	**36.5**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R1** *Project Name:* KTM
Source: Parking Lot Vehicle Movements *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	251.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	241.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9
Distance Attenuation	251.0	-21.0	-21.0	-21.0	-21.0	-21.0	-21.0
Shielding (Barrier Attenuation)	241.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		25.7	22.5	23.5	28.5	34.5	45.4
60 Minute Hourly Adjustment		**25.7**	**22.5**	**23.5**	**28.5**	**34.5**	**45.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R1** *Project Name:* KTM
Source: Motorcyle Safety Course *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	550.0 feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	540.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	140.0	49.8	48.9	49.9	52.0	54.9	59.0
Distance Attenuation	550.0	-8.9	-8.9	-8.9	-8.9	-8.9	-8.9
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		22.9	22.0	23.0	25.1	28.0	32.1
60 Minute Hourly Adjustment		**22.9**	**22.0**	**23.0**	**25.1**	**28.0**	**32.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

Observer Location: **R1**
Source: Trailer Movement & Storage
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	774.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	764.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	57.0	54.9	58.4	60.7	61.7	63.1
Distance Attenuation	774.0	-23.8	-23.8	-23.8	-23.8	-23.8	-23.8
Shielding (Barrier Attenuation)	764.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		27.7	25.6	29.1	31.4	32.4	33.8
60 Minute Hourly Adjustment		**27.7**	**25.6**	**29.1**	**31.4**	**32.4**	**33.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

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

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	274.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	264.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	274.0	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8
Shielding (Barrier Attenuation)	264.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		37.5	34.7	36.4	37.7	38.0	38.5
39 Minute Hourly Adjustment		**35.6**	**32.8**	**34.5**	**35.8**	**36.1**	**36.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

Observer Location: **R2**
Source: Pressure Washer
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	736.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	726.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	82.4	82.2	82.9	83.7	83.9	84.1
Distance Attenuation	736.0	-37.3	-37.3	-37.3	-37.3	-37.3	-37.3
Shielding (Barrier Attenuation)	726.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		39.6	39.4	40.1	40.9	41.1	41.3
30 Minute Hourly Adjustment		**36.6**	**36.4**	**37.1**	**37.9**	**38.1**	**38.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

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

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	418.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	408.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9
Distance Attenuation	418.0	-24.3	-24.3	-24.3	-24.3	-24.3	-24.3
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		9.9	6.7	7.7	12.7	18.7	29.6
60 Minute Hourly Adjustment		**9.9**	**6.7**	**7.7**	**12.7**	**18.7**	**29.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

Observer Location: **R2**
Source: Motorcyle Safety Course
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	400.0	feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	390.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	140.0	49.8	48.9	49.9	52.0	54.9	59.0
Distance Attenuation	400.0	-6.8	-6.8	-6.8	-6.8	-6.8	-6.8
Shielding (Barrier Attenuation)	10.0	-18.0	-18.0	-18.0	-18.0	-18.0	-18.0
Raw (Distance + Barrier)		25.0	24.1	25.1	27.2	30.1	34.2
60 Minute Hourly Adjustment		**25.0**	**24.1**	**25.1**	**27.2**	**30.1**	**34.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

8/13/2018

Observer Location: **R2**
Source: Trailer Movement & Storage
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	707.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	697.0	feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	57.0	54.9	58.4	60.7	61.7	63.1
Distance Attenuation	707.0	-23.0	-23.0	-23.0	-23.0	-23.0	-23.0
Shielding (Barrier Attenuation)	697.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		28.5	26.4	29.9	32.2	33.2	34.6
60 Minute Hourly Adjustment		**28.5**	**26.4**	**29.9**	**32.2**	**33.2**	**34.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

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

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	347.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	337.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	347.0	-36.8	-36.8	-36.8	-36.8	-36.8	-36.8
Shielding (Barrier Attenuation)	337.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		35.5	32.7	34.4	35.7	36.0	36.5
39 Minute Hourly Adjustment		**33.6**	**30.8**	**32.5**	**33.8**	**34.1**	**34.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R3**
Source: Pressure Washer
Condition: Operational

Project Name: KTM
Job Number: 11624
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	756.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	746.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	82.4	82.2	82.9	83.7	83.9	84.1
Distance Attenuation	756.0	-37.6	-37.6	-37.6	-37.6	-37.6	-37.6
Shielding (Barrier Attenuation)	746.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		39.3	39.1	39.8	40.6	40.8	41.0
30 Minute Hourly Adjustment		**36.3**	**36.1**	**36.8**	**37.6**	**37.8**	**38.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R3** *Project Name:* KTM
Source: Parking Lot Vehicle Movements *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	416.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	406.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9
Distance Attenuation	416.0	-24.3	-24.3	-24.3	-24.3	-24.3	-24.3
Shielding (Barrier Attenuation)	406.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		22.4	19.2	20.2	25.2	31.2	42.1
60 Minute Hourly Adjustment		**22.4**	**19.2**	**20.2**	**25.2**	**31.2**	**42.1**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R3** *Project Name:* KTM
Source: Motorcyle Safety Course *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	467.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	467.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	140.0	49.8	48.9	49.9	52.0	54.9	59.0
Distance Attenuation	467.0	-7.8	-7.8	-7.8	-7.8	-7.8	-7.8
Shielding (Barrier Attenuation)	467.0	-10.2	-10.2	-10.2	-10.2	-10.2	-10.2
Raw (Distance + Barrier)		31.8	30.9	31.9	34.0	36.9	41.0
60 Minute Hourly Adjustment		**31.8**	**30.9**	**31.9**	**34.0**	**36.9**	**41.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R3** *Project Name:* KTM
Source: Trailer Movement & Storage *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	766.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	756.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	57.0	54.9	58.4	60.7	61.7	63.1
Distance Attenuation	766.0	-23.7	-23.7	-23.7	-23.7	-23.7	-23.7
Shielding (Barrier Attenuation)	756.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		27.8	25.7	29.2	31.5	32.5	33.9
60 Minute Hourly Adjustment		**27.8**	**25.7**	**29.2**	**31.5**	**32.5**	**33.9**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R4** *Project Name:* KTM
Source: Roof-Top Air Conditioning Unit *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	803.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	793.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	803.0	-44.1	-44.1	-44.1	-44.1	-44.1	-44.1
Shielding (Barrier Attenuation)	793.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		27.9	25.1	26.8	28.1	28.4	28.9
39 Minute Hourly Adjustment		**26.0**	**23.2**	**24.9**	**26.2**	**26.5**	**27.0**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R4** *Project Name:* KTM
Source: Pressure Washer *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,039.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,029.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	82.4	82.2	82.9	83.7	83.9	84.1
Distance Attenuation	1,039.0	-40.3	-40.3	-40.3	-40.3	-40.3	-40.3
Shielding (Barrier Attenuation)	1,029.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		36.6	36.4	37.1	37.9	38.1	38.3
30 Minute Hourly Adjustment		**33.6**	**33.4**	**34.1**	**34.9**	**35.1**	**35.3**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R4** *Project Name:* KTM
Source: Parking Lot Vehicle Movements *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	517.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	507.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9
Distance Attenuation	517.0	-25.7	-25.7	-25.7	-25.7	-25.7	-25.7
Shielding (Barrier Attenuation)	507.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		21.0	17.8	18.8	23.8	29.8	40.7
60 Minute Hourly Adjustment		**21.0**	**17.8**	**18.8**	**23.8**	**29.8**	**40.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R4** *Project Name:* KTM
Source: Motorcyle Safety Course *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	856.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	846.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	140.0	49.8	48.9	49.9	52.0	54.9	59.0
Distance Attenuation	856.0	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8
Shielding (Barrier Attenuation)	846.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		32.5	31.6	32.6	34.7	37.6	41.7
60 Minute Hourly Adjustment		**32.5**	**31.6**	**32.6**	**34.7**	**37.6**	**41.7**

STATIONARY SOURCE NOISE PREDICTION MODEL 8/13/2018

Observer Location: **R4** *Project Name:* KTM
Source: Trailer Movement & Storage *Job Number:* 11624
Condition: Operational *Analyst:* A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,090.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,080.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	10.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	57.0	54.9	58.4	60.7	61.7	63.1
Distance Attenuation	1,090.0	-26.8	-26.8	-26.8	-26.8	-26.8	-26.8
Shielding (Barrier Attenuation)	1,080.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		24.7	22.6	26.1	28.4	29.4	30.8
60 Minute Hourly Adjustment		**24.7**	**22.6**	**26.1**	**28.4**	**29.4**	**30.8**