Polopolus

NOISE IMPACT ANALYSIS

CITY OF EASTVALE

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TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-15	Interstate 15
IEC	International Electrotechnical Commission
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
PPV	Peak Particle Velocity
Project	Polopolus
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to assess the noise exposure and the necessary noise mitigation measures for the proposed Polopolus development ("Project"). The proposed Project is made up of two sites: Site 1 and Site 2. Site 1 is located on the southeast corner of Hamner Avenue and Schleisman Avenue, and Site 2 is located on the southwest corner of Hamner Avenue and Riverboat Drive, in the City of Eastvale. Site 1 land uses include an eight-vehicle fueling position gas station with market, 3,500 square feet of fast-food restaurant with drive-through window use, 2,000 square feet of coffee shop with drive-through window use, a 6,000 square-foot high turnover sit-down restaurant, 4,000 square feet of commercial retail use, 4,000 square feet of fast-food restaurant without drive-through window use, 10,000 square feet of medical office use, a 130-room hotel, 40,000 square feet of government office use, and a 25,000 square-foot library. Site 2 would be developed with 16 VFP gas station with market and drive-through car wash. However, since Site 2 is immediately adjacent to noise-sensitive residential homes this noise study evaluates a worst-case operational noise condition with only a higher noise-generating car wash use within the entirety of Site 2. This study has been prepared consistent with applicable City of Eastvale noise standards and significance criteria based on 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 18 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 *Polopolus 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 and Opening Year 2019 traffic conditions. The analysis shows that the unmitigated 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 potential noise sources within Polopolus sites, this analysis estimates the Project-related operational (stationary-source) noise levels at the nearby noise-sensitive receiver locations. The Project-related operational noise sources are expected to include roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activities within Site 1, and car wash tunnel entrance activity, tunnel exit activity, and vacuum activities within Site 2. The operational noise analysis is separated by Sites 1 and 2 to describe the potential impacts at the adjacent receiver locations based on the unique noise source activity at each Site.

SITE 1: COMPLIANCE WITH APPLICABLE NOISE STANDARDS

The analysis shows that the unmitigated Site 1 Project-related operational noise levels associated with the roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activities will satisfy the City of Eastvale exterior noise level standards at all the adjacent off-site receiver locations in the Project study area. Therefore, no exterior noise mitigation measures are required to reduce the Site 1 Project operational noise levels.

SITE 2: COMPLIANCE WITH APPLICABLE NOISE STANDARDS

The analysis shows that the unmitigated received noise levels generated by the Site 2 drive-through car wash tunnel entrance activity, tunnel exit activity, and vacuum activities would satisfy the City of Eastvale 60 dBA L_{eq} daytime (7:00 a.m. to 10:00 p.m.) exterior noise level standards. However, the car wash noise levels would exceed the 50 dBA L_{eq} nighttime (10:00 p.m. to 7:00 a.m.) exterior noise level standard at locations nearest the Site 2 car wash (R1 and R3 to R6). This is a *potentially significant* impact. Therefore, to satisfy the City of Eastvale nighttime noise standards, Noise mitigation measure NOI-1 requires that car wash activity be limited to the daytime hours between (7:00 a.m. and 10:00 p.m.). With application of mitigation measure NOI-1 impacts at receiver locations R1 and R3 to R6 would be *less than significant*.

NOI-1 No car wash activities shall be permitted during the nighttime hours of 10:00 p.m. to 7:00 a.m.

SITE 1 & 2: PROJECT-SOURCE INCREASE IN AMBIENT NOISE CONDITIONS

To assess the potential increase in ambient noise levels the Project-source noise contributions to the ambient noise environment was analyzed under the following scenarios:

Daytime

- Without and with Project Site 1 and 2 operational noise levels at outdoor living areas (backyards) and first-floor building façades;
- Without and with Project Site 2 (car wash) operational noise levels at first and second-floor building façades closest to the car wash use.

Nighttime

- Without and with Project Site 1 operational noise levels at outdoor living areas (backyards) and first-floor building façades (no Site 2 car wash activities shall be permitted to operate during nighttime hours as a part of Project operational noise mitigation).

The analysis shows Project-source incremental noise contributions to the ambient noise environment would be *less than significant* at outdoor living areas (backyards) and first-floor building façades under daytime conditions (Site 1 and 2) and nighttime conditions (Site 1 only). In addition, first-floor building façades adjacent to the Site 2 car wash would experience *less than significant* Project-source noise increases as these receiver locations benefit from the existing 6-foot high noise barrier along the Site 2 westerly boundary.

However, the Project-source incremental contribution to the ambient noise condition at receiver location R6, second-floor building façade, would approach 6.2 dBA L_{eq}. In the context of the ambient noise condition (54.4 dBA L_{eq}), this is a *potentially significant* impact. At the second-floor receiver location, a physical noise barrier exceeding 14 feet would be required to ensure that the incremental noise increase would not exceed 5 dBA, and therefore remain less than significant. Construction of such a barrier would of itself result in land use and aesthetic incompatibilities; and is generally considered unreasonably cost-prohibitive. It is therefore considered infeasible to fully mitigate operational-source noise impacts at the potentially affected R6 receiver location. The increase in ambient noise conditions at receiver R6 (second-floor façade) would exceed 5 dBA, and the incremental increase in the ambient noise condition would be *significant and unavoidable*. Notwithstanding, it is recommended the following noise-reducing design features be considered, and where feasible, incorporated in the final car wash building site plan designs:

- Maximize the distance between noise sources and off-site receptors;
- Incorporate parapet walls where appropriate; and
- Incorporate on-site noise barriers, landscaping, or similar physical features that would act to generally attenuate noise emanating from the car wash site.

Under all scenarios and at all other receiver locations, Project-source contributions to ambient noise conditions would be *less than significant*.

SITE 2: SHORT-TERM NOISE EVENTS

Car wash activities typically cycle on and off as each car progresses through the tunnel. Each phase of the car wash requires different equipment that will start and stop throughout the wash process. In other words, individual car wash equipment like the mechanical dryers do not operate continuously. Short-term noise events such as car doors slamming, air blowers cycling on and off, and water spraying are expected to occur and produce high noise levels over short durations of a few seconds to a few minutes, which are likely to be audible and perceived as nuisance noise. However, these short-term events will not represent a significant contribution to the overall average L_{eq} noise levels when evaluated based on the City of Eastvale L_{eq} average noise level standards. As such, which daytime car wash operational noise levels are shown to be compliant with City of Eastvale standards, short-term events may still be perceived as nuisance noise over shorter durations.

CONSTRUCTION NOISE ANALYSIS

Construction noise represents a short-term increase on the ambient noise levels. 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 primary Project construction activity. Using sample reference noise levels to represent the planned construction activities of the Polopolus site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the City of Eastvale General Plan and Municipal Code do not identify specific construction noise level thresholds, a threshold is identified based on the National Institute for Occupational Safety and Health (NIOSH) limits for construction noise, which is consistent with criteria established by the Federal Transit Administration (FTA). The results of the analysis show that the Project-related short-term construction noise levels are expected to range from 58.4 to 79.1 dBA L_{eq} and will satisfy the 85 dBA L_{eq} threshold identified by NIOSH at all receiver locations.

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. A temporary noise level increase of 12 dBA L_{eq} is considered a potentially significant impact based on the Caltrans substantial noise level increase criteria which is used to assess the Project-construction noise level increases. (3) The analysis shows that the Project will contribute unmitigated, worst-case construction noise level increases ranging from 0.1 to 23.9 dBA L_{eq} at the nearby receiver locations during the daytime construction hours. Due to the magnitude of the worst-case temporary noise level increases during Project construction activities which are shown to exceed the 12 dBA L_{eq} significance threshold at receiver locations R3 to R6, R10, and R11, the unmitigated construction-source noise level increases are therefore considered *potentially significant*. The following mitigation measures are expected to reduce Project construction-source noise impacts. However, even with application of the noise mitigation measures and Municipal Code construction hour limitations, it is anticipated the Project construction-source noise levels at nearby receiver locations would exceed 12 dBA L_{eq}. Project construction-source noise impacts are therefore recognized as *significant and unavoidable*.

CONSTRUCTION NOISE MITIGATION MEASURES

While not considered mitigation, the Project Applicant shall comply with all City of Eastvale Municipal Code requirements (City of Eastvale Municipal Code, Section 8.52.020 et al.) acting to minimize effects of construction-source noise. To further reduce Project construction-source noise impacts, the following mitigation measures shall also be implemented:

NOI-2 The construction contractor(s) shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.

NOI-3 The construction contractor(s) shall limit haul truck deliveries to the same hours specified for construction equipment (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).

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The analysis shows that the unmitigated Project-construction vibration levels of up to 0.068 in/sec peak-particle-velocity (PPV) will remain below the City of Eastvale 0.0787 in/sec PPV standard at all receiver locations, and are therefore, considered a *less than significant* impact. Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City of Eastvale requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise Levels	7	*Less Than Significant*	*n/a*
Operational Noise Level Compliance	9	*Less Than Significant*	*n/a*
Operational Noise Level Increases (Permanent)		*Potentially Significant*	*Significant and Unavoidable*
Construction Noise Level Compliance	10	*Less Than Significant*	*n/a*
Construction Noise Level Increases (Temporary)		*Potentially Significant*	*Significant and Unavoidable*
Construction Vibration Levels		*Less Than Significant*	*n/a*

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1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed Polopolus Project is made up of two sites: Site 1 and Site 2. Site 1 is located on the southeast corner of Hamner Avenue and Schleisman Avenue, and Site 2 is located on the southwest corner of Hamner Avenue and Riverboat Drive, in the City of Eastvale, as shown on Exhibit 1-A. Existing single-family residential uses are located north, west, and east of the Project site, and the Silverlakes Sports Complex park is located south of the Project site. Interstate15 (I-15) is located approximately one-quarter mile east of the Project site. The closest airport to the Project site is Chino Airport which is located roughly 4 miles northwest of the Project site boundaries.

1.2 PROJECT DESCRIPTION

The Project is proposed to consist of two sites: Site 1 and Site 2, as shown on Exhibits 1-B and 1-C, respectively. Site 1 land uses include an eight-vehicle fueling position gas station with market, 3,500 square feet of fast-food restaurant with drive-through window use, 2,000 square feet of coffee shop with drive-through window use, a 6,000 square-foot high turnover sit-down restaurant, 4,000 square feet of commercial retail use, 4,000 square feet of fast-food restaurant without drive-through window use, 10,000 square feet of medical office use, a 130-room hotel, 40,000 square feet of government office use, and a 25,000 square-foot library. Site 2 would be developed with 16 VFP gas station with market and drive-through car wash. However, since Site 2 is immediately adjacent to noise-sensitive residential homes this noise study evaluates a worst-case operational noise condition with only a higher noise-generating car wash use within the entirety of Site 2.

The on-site Project-only operational noise sources are expected to include: roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activities within Site 1, and car wash tunnel entrance activity, tunnel exit activity, and vacuum activities within Site 2.

EXHIBIT 1-A: LOCATION MAP

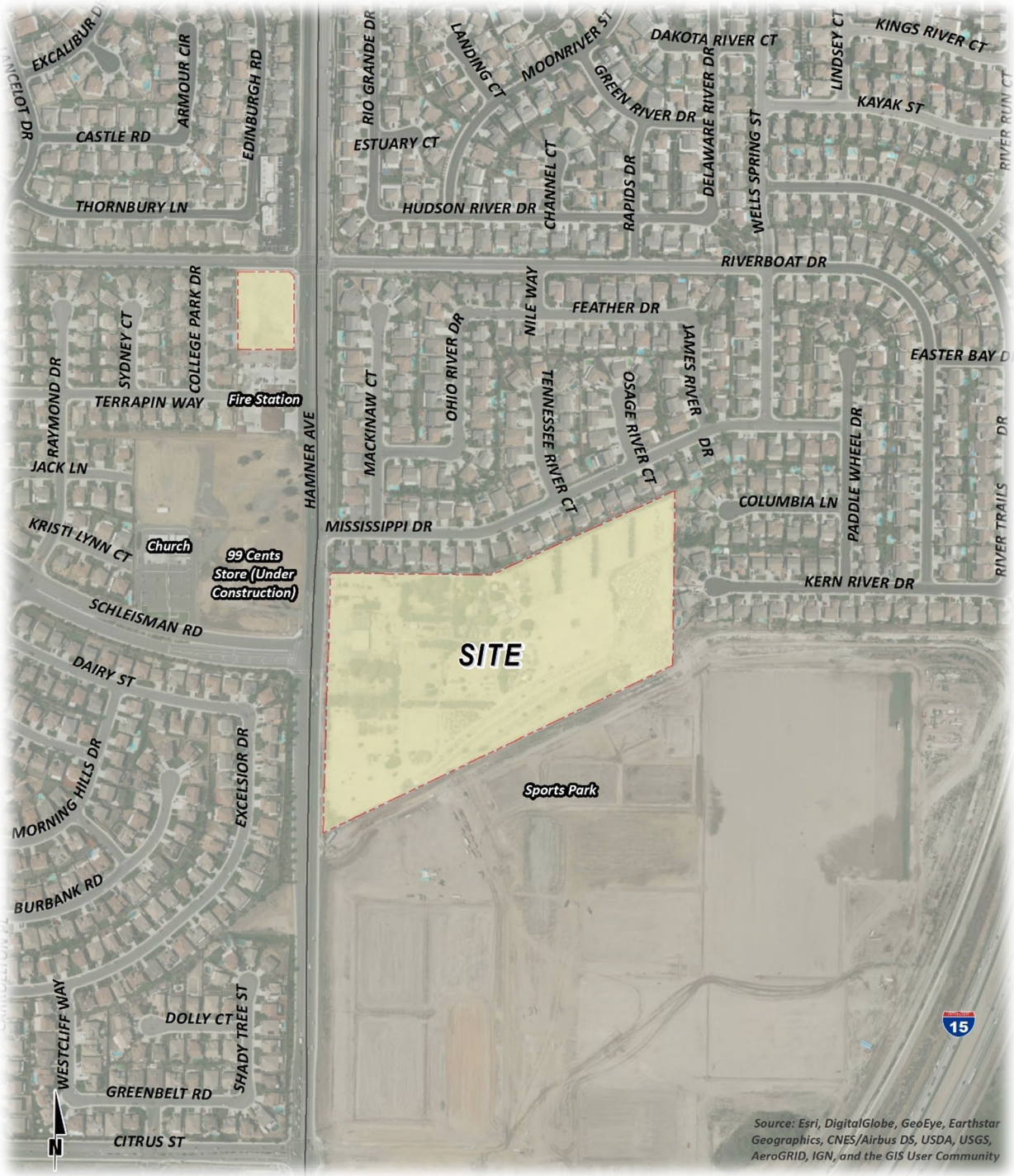


EXHIBIT 1-B: SITE 1 PLAN

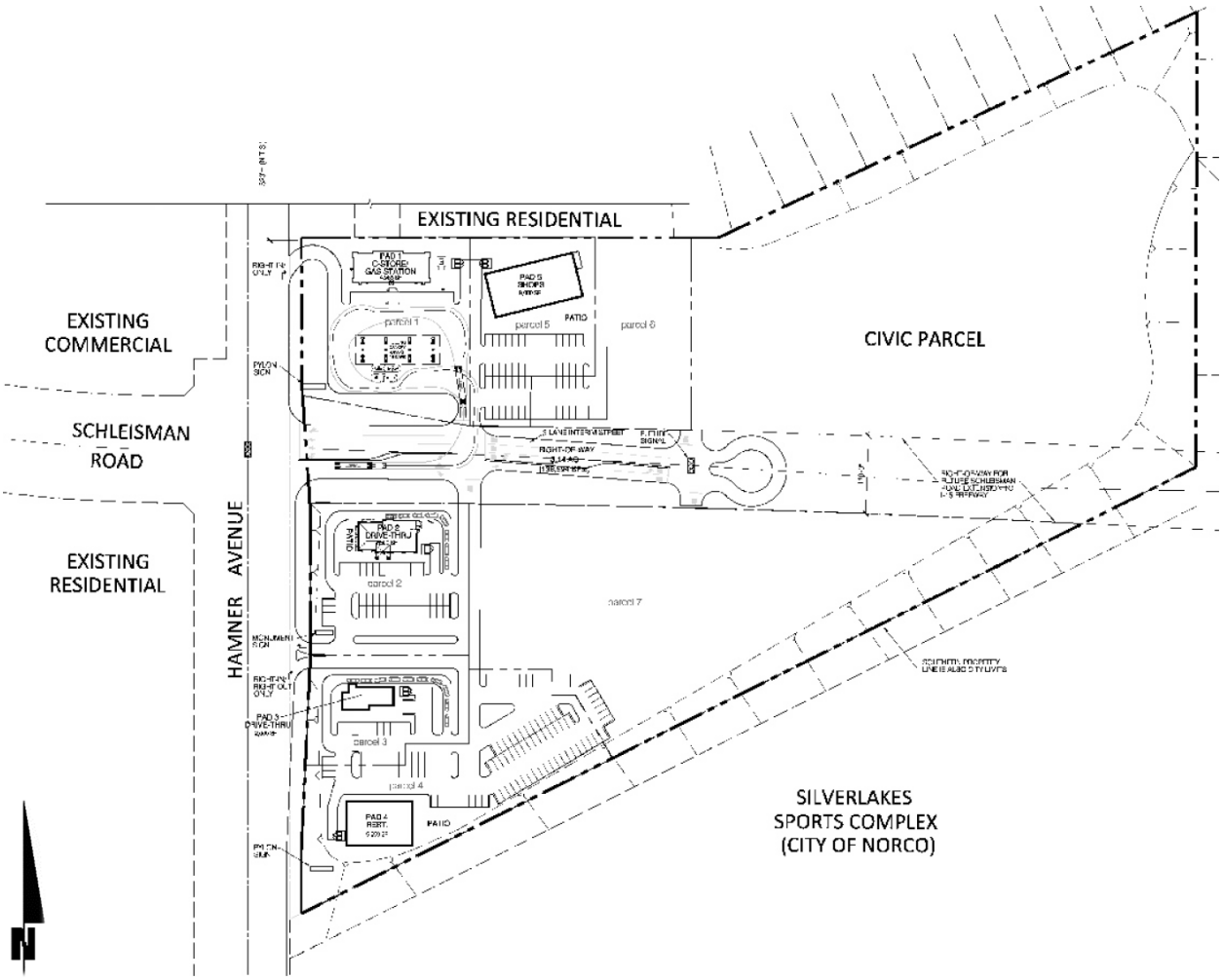
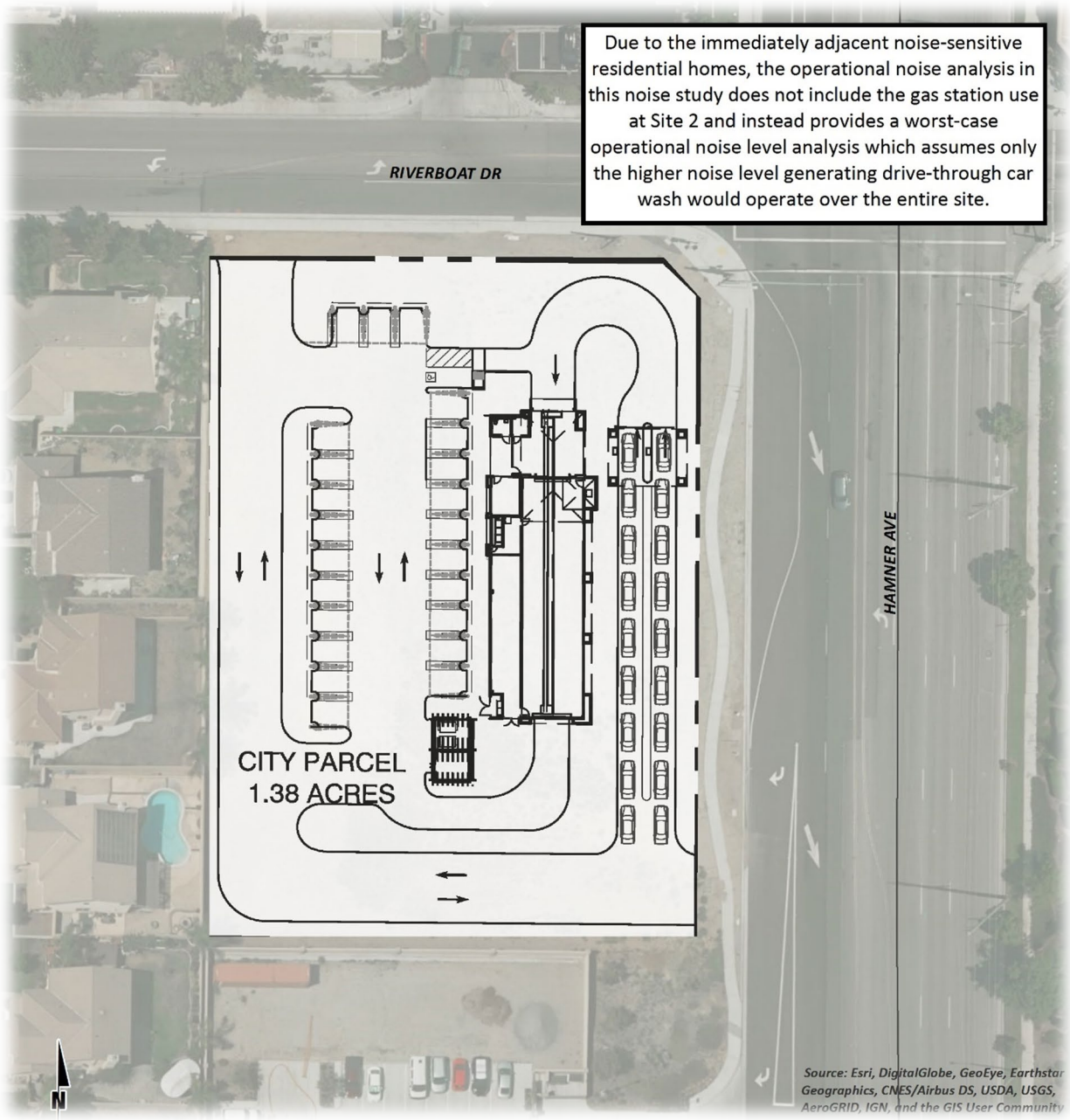


EXHIBIT 1-B: SITE 2 PLAN (WORST-CASE CAR WASH)



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 City of Eastvale 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)

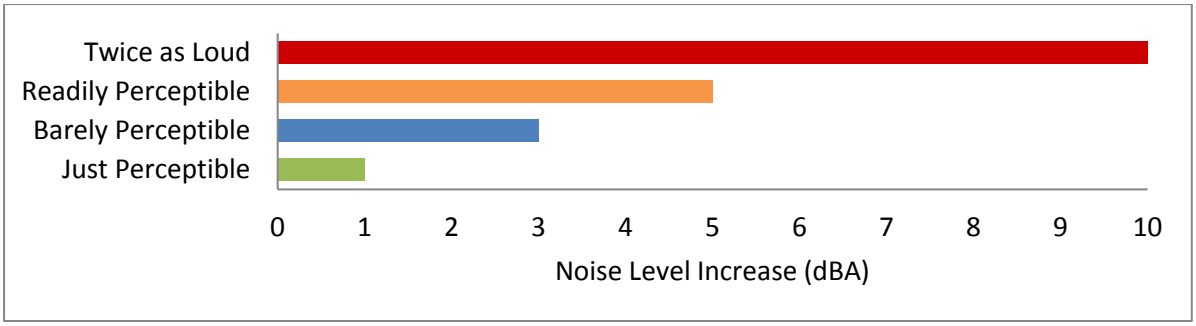
2.7 COMMUNITY RESPONSE TO NOISE

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

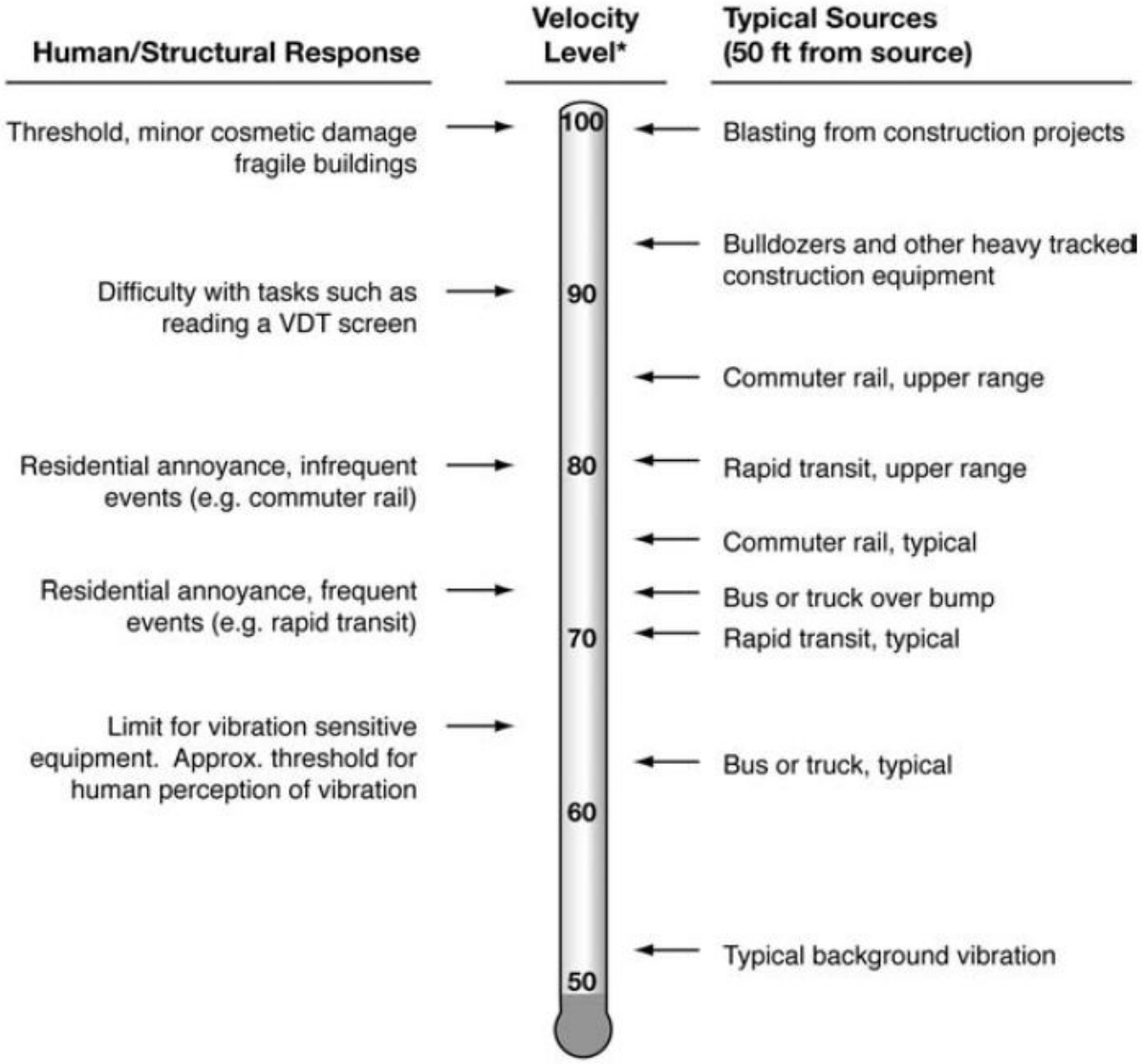
According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (11), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include 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. (12) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING STANDARDS

The 2016 State of California's Green Building Standards Code contains mandatory measures for building construction in Section 5.507 on Environmental Comfort. (13) 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 structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available, and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF EASTVALE NOISE ELEMENT

The City of Eastvale has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of City of Eastvale from excessive exposure to noise. (14) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation and stationary noise sources. To protect the City of Eastvale residents from excessive noise, the Noise Element contains the following four goals:

N-1 *Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors and noise-sensitive uses of Eastvale.*

N-2 *Locate noise-tolerant land uses within areas irrevocably committed to land uses that are noise-producing, such as transportation corridors.*

N-3 *Ensure that noise sensitive uses do not encroach into areas needed by noise generating uses.*

N-4 *Locate noise sources away from existing noise sensitive land uses unless appropriate noise control measures are provided.*

3.3.1 STATIONARY-SOURCE NOISE LEVEL STANDARDS

The City of Eastvale General Plan Noise Element identifies exterior noise limits to control operational noise impacts associated with the development of the proposed Polopolus Project. Table N-4 of the Noise Element *provides the City's standards for maximum exterior non-transportation noise levels to which land designated for residential land uses may be exposed for any 30-minute period on any day.* (14) For the purposes of this analysis, the noise generated by the roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activities within Site 1, and car wash tunnel entrance activity, tunnel exit activity, and vacuum activities within Site 2 of the proposed Project will be evaluated based on the City's stationary source standards at the nearby residential land uses.

Table N-4 of the Noise Element (shown on Exhibit 3-A below) requires an exterior noise level standard for the nearby noise-sensitive single-family residential land uses of 60 dBA L_{eq} between the daytime hours of 7:00 a.m. and 10:00 p.m., and 50 dBA L_{eq} between the nighttime hours of 10:00 p.m. to 7:00 a.m. (14)

EXHIBIT 3-A: EXTERIOR NOISE LEVEL STANDARDS FOR NON-TRANSPORTATION NOISE

Land Use Type	Time Period	Maximum Noise Level (dBA)
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60

Source: City of Eastvale General Plan Noise Element, Table N-4.

3.3.2 VIBRATION LEVEL STANDARDS

The City of Eastvale General Plan Noise Element, Policy N-3, identifies a vibration level standard for sensitive land uses of 0.0787 inches per second peak particle velocity (PPV). Therefore, for the purposes of this analysis, the vibration level shall not exceed 0.0787 in/sec PPV at the nearby sensitive receiver locations during Project construction activities capable of generating vibration levels. The construction vibration standards are provided on Table 3-1.

TABLE 3-1: VIBRATION LEVEL STANDARDS

City	Peak Particle Velocity (PPV) Standard (in/sec)
Eastvale[1]	0.0787

[1] Source: City of Eastvale General Plan Noise Element, Policy N-3.

3.4 CONSTRUCTION NOISE STANDARDS

The City of Eastvale has set restrictions to control noise impacts associated with the construction of the proposed Project. According to the City of Eastvale Municipal Code Section 8.52.020, construction activities are limited to 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. (15) While the City establishes limits to the hours during which construction activity may take place, neither the City's General Plan or 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*.

To evaluate whether the Project will generate potentially significant temporary construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (16) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (16) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time period, they are expressed as L_{eq} noise levels. Therefore, the noise level threshold of 85 dBA L_{eq} over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

The 85 dBA L_{eq} threshold is also consistent with the FTA *Transit Noise and Vibration Impact Assessment* criteria for construction noise which identifies an hourly construction noise level threshold of 90 dBA L_{eq} during daytime hours, and 80 dBA L_{eq} during nighttime hours for construction for general assessment at noise-sensitive uses (e.g., residential, medical/hospital, school, etc.). (11) Detailed assessment, according to the FTA, identifies an 8-hour dBA L_{eq} noise level threshold specific to noise-sensitive uses of 80 dBA L_{eq}. Therefore, the Noise Study relies on the NIOSH 85 dBA L_{eq} threshold, consistent with FTA general and detailed assessment criteria for noise-sensitive uses and represents an appropriate threshold for construction noise analysis. The construction noise standards are shown on Table 3-2.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

City	Permitted Hours of Construction Activity	Construction Noise Level Threshold (dBA L_{eq})[2]
Eastvale[1]	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	85

[1] Source: Section 8.52.020 of the City of Eastvale Municipal Code (Appendix 3.1).
[2] Source: NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure, June 1998.

4 SIGNIFICANCE CRITERIA

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

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

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

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

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

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

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

While the CEQA Guidelines and the City of Eastvale 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. The Project site is not located within two miles of a public airport or within an airport land use plan; nor is the Project within the vicinity of a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guidelines E and F.

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.* (17) 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.

4.1.1 SUBSTANTIAL PERMANENT NOISE LEVEL INCREASES

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

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.

4.1.2 SUBSTANTIAL TEMPORARY OR PERIODIC NOISE LEVEL INCREASES

Due to the temporary, short-term nature of noise-generating construction activities, the temporary or periodic noise level increases over the existing ambient conditions must be considered under CEQA Guideline D, consistent with the legal case, *Friends of Riverside's Hills v. Riverside Transportation Commission, et al.* (19) Therefore, the Caltrans *Traffic Noise Analysis Protocol* 12 dBA L_{eq} *substantial* noise level increase threshold is used in this analysis to assess temporary noise level increases. (3) If the Project-related construction noise levels generate a temporary noise level increase above the existing ambient noise levels of up to 12 dBA L_{eq}, then the Project construction noise level increases will be considered a potentially significant impact. Although the Caltrans recommendations were specifically developed to assess traffic noise impacts, the 12 dBA L_{eq} substantial noise level increase threshold is used in California to address noise level increases with the potential to exceed existing conditions. (3)

4.2 SIGNIFICANCE CRITERIA SUMMARY

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

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels exceed the exterior 60 dBA L_{eq} daytime or 50 dBA L_{eq} nighttime noise level standards at nearby sensitive receiver locations (City of Eastvale General Plan Noise Element, Table N-4). or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq}, and the Project creates a community noise level impact of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
    - occur at any time other than the permitted 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 (Section 8.52.040 of the City of Eastvale Municipal Code); or
    - generate noise levels which exceed the 85 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure); or
    - generate temporary Project construction-related noise level increases which exceed the 12 dBA L_{eq} *substantial* noise level increase threshold at noise-sensitive receiver locations (Caltrans, Traffic Noise Analysis Protocol).
- If short-term Project generated construction vibration levels exceed the City of Eastvale acceptable vibration standard of 0.0787 in/sec PPV at sensitive receiver locations (City of Eastvale General Plan, Policy N-3).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Condition(s)	Significance Criteria	
		Daytime	**Nighttime**
Off-Site Traffic Noise[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	
Operational Noise	Exterior Noise Level Standards[2]	60 dBA L_{eq}	50 dBA L_{eq}
	if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
	if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
	if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction Noise & Vibration	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[3]		
	Noise Level Threshold[4]	85 dBA L_{eq}	n/a
	Noise Level Increase[5]	12 dBA L_{eq}	n/a
	Vibration Level Threshold[6]	0.0787 PPV	n/a

[1] Source: FICON, 1992.
[2] Source: City of Eastvale General Plan Noise Element, Table N-4.
[3] Source: Section 8.52.040 of the City of Eastvale Municipal Code (Appendix 3.1).
[4] Source: NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure, June 1998.
[5] Source: Caltrans Traffic Noise Analysis Protocol, May 2011.
[6] Source: City of Eastvale General Plan Noise Element, Policy N-3.
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.; "n/a" = No nighttime construction activity is permitted and therefore, no nighttime construction noise level threshold is identified; "PPV" = Peak particle velocity.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, noise level measurements were taken at sensitive receiver locations in the Project study area. The measurement locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations.

To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, January 18th and from Wednesday, January 24th to Thursday, January 25th, 2018 for 24-hour periods. Further, to better describe the ambient noise environment at residential homes adjacent to the proposed car wash (Site 2 of the Project), short-term noise level measurements were collected over a one-hour duration on Thursday, February 22nd, 2018. These short-term noise level measurements were collected to further describe existing ambient noise level at the backyards of adjacent homes to the proposed Site 2 car wash use. This included a measurement at a height of 14 feet to represent the existing ambient noise environment at the second-floor building façades. Appendix 5.1 includes study area photos for all measurement locations.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the noise levels were measured during typical weekday conditions. 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. (20)

5.2 NOISE MEASUREMENT LOCATIONS

The 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. (11)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (11) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 LONG-TERM NOISE MEASUREMENT RESULTS (SITES 1 & 2)

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. The long-term noise level measurements do not account for any existing noise barrier noise attenuation. 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 the northeast corner of Hamner Avenue and Riverboat Drive adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 83.2 dBA CNEL. The hourly noise levels measured at location L1 ranged from 75.8 to 82.0 dBA L_{eq} during the daytime hours and from 67.2 to 81.9 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 79.9 dBA L_{eq} with an average nighttime noise level of 75.5 dBA L_{eq}.
- Location L2 represents the noise levels at the northwest Project site boundary adjacent to existing residential homes on College Park Drive. The noise level measurements collected show an overall 24-hour exterior noise level of 79.0 dBA CNEL. The hourly noise levels measured at location L2 ranged from 71.2 to 77.9 dBA L_{eq} during the daytime hours and from 64.4 to 78.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 74.8 dBA L_{eq} with an average nighttime noise level of 71.6 dBA L_{eq}.
- Location L3 represents the noise levels south of Site 2 adjacent to an existing fire station on Hamner Avenue, near existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 65.9 dBA CNEL. At location L3 the background ambient noise levels ranged from 58.5 to 63.3 dBA L_{eq} during the daytime hours to levels of 50.5 to 61.9 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 61.3 dBA L_{eq} with an average nighttime noise level of 58.6 dBA L_{eq}.
- Location L4 represents the noise levels north of the Project site on Mississippi Drive in an existing residential community. The noise level measurements collected show an overall 24-hour exterior noise level of 65.0 dBA CNEL. The hourly noise levels measured at location L4 ranged from 53.1 to 63.6 dBA L_{eq} during the daytime hours and from 52.1 to 62.6 dBA L_{eq} during the nighttime hours.

The energy (logarithmic) average daytime noise level was calculated at 58.9 dBA L_{eq} with an average nighttime noise level of 58.4 dBA L_{eq}.

- Location L5 represents the noise levels on Kern River Road east of the Project site within an existing residential community. The noise level measurements collected show an overall 24-hour exterior noise level of 66.5 dBA CNEL. The hourly noise levels measured at location L5 ranged from 56.7 to 61.7 dBA L_{eq} during the daytime hours and from 56.3 to 62.2 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 59.2 dBA L_{eq} with an average nighttime noise level of 59.8 dBA L_{eq}.
- Location L6 represents the noise levels west of the Project site in an existing church parking lot near existing residential homes north of Schleisman Road. The noise level measurements collected show an overall 24-hour exterior noise level of 64.0 dBA CNEL. The hourly noise levels measured at location L6 ranged from 53.5 to 63.3 dBA L_{eq} during the daytime hours and from 49.2 to 61.3 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 60.5 dBA L_{eq} with an average nighttime noise level of 56.6 dBA L_{eq}.
- Location L7 represents the noise levels on Hamner Avenue adjacent to the western Project site boundary near existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 73.8 dBA CNEL. At location L7 the background ambient noise levels ranged from 66.7 to 73.2 dBA L_{eq} during the daytime hours to levels of 58.4 to 71.8 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 71.1 dBA L_{eq} with an average nighttime noise level of 65.6 dBA L_{eq}.
- Location L8 represents the noise levels at the western Project site boundary on Hamner Avenue near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 75.7 dBA CNEL. The hourly noise levels measured at location L8 ranged from 69.0 to 73.3 dBA L_{eq} during the daytime hours and from 60.8 to 73.7 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 71.8 dBA L_{eq} with an average nighttime noise level of 68.2 dBA L_{eq}.
- Location L9 represents the noise levels south of the Project site on Old Hamner Avenue near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 65.4 dBA CNEL. The hourly noise levels measured at location L9 ranged from 52.2 to 58.7 dBA L_{eq} during the daytime hours and from 54.8 to 62.7 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 55.7 dBA L_{eq} with an average nighttime noise level of 59.1 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions at measurement locations L1 to L9. 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. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

5.4 SHORT-TERM NOISE MEASUREMENT RESULTS (SITE 2)

Table 5-2 identifies the hourly noise levels at each noise level measurement location based on a one-hour measurement collected between 10:00 a.m. to 11:00 a.m. on Thursday, February 22nd, 2018 to represent the quieter, existing residential noise environment adjacent to the proposed car wash use. The short-term noise level measurements do not include the barrier noise attenuation provided by the existing 6-foot high backyard perimeter wall for the homes located on College Park Drive. Location S3 includes an additional noise level measurement at 14 feet to determine difference in noise level between existing ambient first and second-floor building façade noise levels, with this relationship applied to the other locations to determine the second-floor ambient noise levels. Based on the S3 measurements, the difference between the first-floor (5 feet) and second-floor (14 feet) noise levels is 0.8 dBA L_{eq}. Appendix 5.3 provides study-area photos of Site 2 measurement locations and a summary of the existing ambient noise levels described below:

- Location S1 represents the noise levels adjacent to the residential homes at 12653 and 12679 Thornbury Lane north of the Project site across Riverboat Drive. The hourly noise levels measured at location S1 approached 58.9 dBA L_{eq} at the first-floor measurement location, which results in a calculated second-floor ambient noise level of 58.1 dBA L_{eq}.
- Location S2 represents the noise levels adjacent to the residential homes at 7012 and 7022 College Park Drive west of the Project site. The hourly noise levels measured at location S2 approached 57.1 dBA L_{eq} at the first-floor measurement location, which results in a calculated second-floor ambient noise level of 56.3 dBA L_{eq}. While 7012 College Park Drive is a single-story residential home, the second-floor noise levels shown on Table 5-2 for location S2 represent those at 7022 College Park Drive.
- Location S3 represents the noise levels adjacent to the residential home at 7032 College Park Drive west of the Project site. The hourly noise levels measured at location S3 approached 56.0 dBA L_{eq} at the first-floor measurement location, and the measured second-floor ambient noise level was 55.2 dBA L_{eq} at a height of 14 feet. Based on the S3 measurements, the difference between the first-floor (5 feet) and second-floor (14 feet) noise levels is 0.8 dBA L_{eq}.
- Location S4 represents the noise levels adjacent to the residential home at 7042 College Park Drive west of the Project site. The hourly noise levels measured at location S4 approached 55.2 dBA L_{eq} at the first-floor measurement location, which results in a calculated second-floor ambient noise level of 54.4 dBA L_{eq}.

TABLE 5-1: 24-HOUR (LONG-TERM) AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance to Project Boundary (Feet)	Description	Energy Average Hourly Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	210'	Located north of the Project site on the northeast corner of Hamner Avenue and Riverboat Drive adjacent to existing residential homes.	79.9	75.5	83.2
L2	0'	Located at the northwest Project site boundary adjacent to existing residential homes on College Park Drive.	74.8	71.6	79.0
L3	155'	Located south of Site 2 adjacent to an existing fire station on Hamner Avenue, near existing residential homes.	61.3	58.6	65.9
L4	180'	Located north of the Project site on Mississippi Drive in an existing residential community.	58.9	58.4	65.0
L5	1,060'	Located on Kern River Road east of the Project site within an existing residential community.	59.2	59.8	66.5
L6	670'	Located west of the Project site in an existing church parking lot near existing residential homes north of Schleisman Road.	60.5	56.6	64.0
L7	0'	Located on Hamner Avenue adjacent to the western Project site boundary near existing residential homes.	71.1	65.6	73.8
L8	0'	Located at the western Project site boundary on Hamner Avenue near existing residential homes.	71.8	68.2	75.7
L9	3,700'	Located south of the Project site on Old Hamner Avenue near existing residential homes.	55.7	59.1	65.4

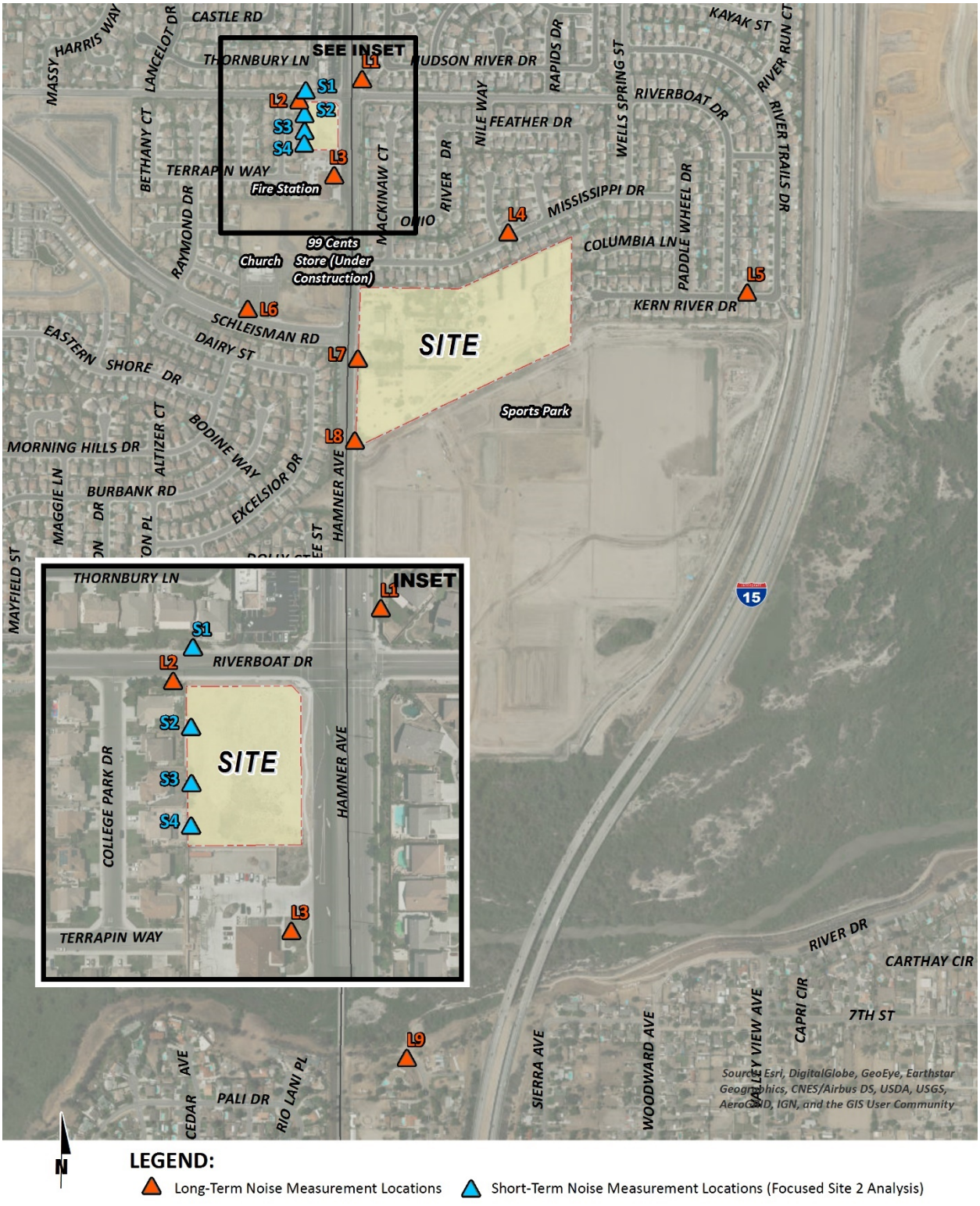
[1] See Exhibit 5-A for the noise level measurement locations.
[2] The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 5-2: 1-HOUR (SHORT-TERM) AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Floor (Height)	Represented Address	Short-Term 1-Hour Noise Levels (dBA L_{eq})[2]
S1	1st (5 Feet)	12653 & 12679 Thornbury lane	58.9
	2nd (14 Feet)		58.1 (estimated)
S2	1st (5 Feet)	7012 & 7022 College Park Drive	57.1
	2nd (14 Feet)		56.3 (estimated)
S3	1st (5 Feet)	7032 College Park Drive	56.0
	2nd (14 Feet)		55.2 (measured)
S4	1st (5 Feet)	7042 College Park Drive	55.2
	2nd (14 Feet)		54.4 (estimated)

[1] See Exhibit 5-A for the noise level measurement locations.
[2] The short-term 24-hour measurement worksheets are included in Appendix 5.3. Second-floor noise levels at locations S1, S2, and S4 are estimated based on the measured difference between the first and second-floor noise levels collected at location S3.

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 estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (21) 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. (22) 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 18 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Eastvale General Plan Circulation Element, and the posted vehicle speeds. For this analysis, soft site conditions are used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Caltrans' research has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model as used in this off-site traffic noise analysis. (23)

The Existing and Opening Year 2019 average daily traffic volumes used for this study are presented on Table 6-2 and are provided by *Polopolus Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

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	Scholar Wy.	n/o Schleisman Rd.	Residential	50'	35
2	Scholar Wy.	s/o Schleisman Rd.	Residential	50'	35
3	Hamner Av.	n/o Limonite Av.	Commercial	76'	45
4	Hamner Av.	s/o Limonite Av.	Commercial	76'	45
5	Hamner Av.	s/o 68th St.	Residential	76'	45
6	Hamner Av.	s/o Riverboat Dr.	Residential	76'	45
7	Hamner Av.	s/o Schleisman Rd.	Residential	76'	45
8	Hamner Av.	s/o Citrus St.	Residential	76'	45
9	Limonite Av.	w/o Hamner Av.	Commercial	76'	45
10	Limonite Av.	e/o Hamner Av.	Commercial	76'	45
11	Limonite Av.	e/o I-15 Fwy.	Commercial	76'	45
12	68th St.	w/o Hamner Av.	Residential	59'	45
13	68th St.	e/o Hamner Av.	Residential	59'	45
14	Riverboat Dr.	w/o Hamner Av.	Residential	37'	40
15	Schleisman Rd.	w/o Scholar Wy.	Residential	76'	45
16	Schleisman Rd.	e/o Scholar Wy.	Residential	76'	45
17	Citrus St.	w/o Hamner Av.	Residential	50'	45
18	Citrus St.	e/o Hamner Av.	Residential	50'	45

[1] Source: City of Eastvale General Plan Land Use Map.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the City of Eastvale General Plan Circulation Element.
[3] Source: Polopolus Traffic Impact Analysis, September 2017.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's)[1]			
			Existing		Opening Year 2019	
			Without Project	With Project	Without Project	With Project
1	Scholar Wy.	n/o Schleisman Rd.	7.3	7.5	7.9	8.1
2	Scholar Wy.	s/o Schleisman Rd.	7.0	7.3	7.9	8.1
3	Hamner Av.	n/o Limonite Av.	25.3	25.6	36.0	36.4
4	Hamner Av.	s/o Limonite Av.	22.8	24.9	30.1	32.3
5	Hamner Av.	s/o 68th St.	18.2	21.0	25.6	28.4
6	Hamner Av.	s/o Riverboat Dr.	26.2	29.1	33.9	36.9
7	Hamner Av.	s/o Schleisman Rd.	22.4	25.4	29.3	32.2
8	Hamner Av.	s/o Citrus St.	30.7	32.5	37.4	39.2
9	Limonite Av.	w/o Hamner Av.	28.7	29.2	37.3	37.8
10	Limonite Av.	e/o Hamner Av.	42.6	43.9	51.8	53.1
11	Limonite Av.	e/o I-15 Fwy.	37.9	38.2	48.5	48.9
12	68th St.	w/o Hamner Av.	9.0	9.4	9.7	10.1
13	68th St.	e/o Hamner Av.	12.8	13.1	15.1	15.4
14	Riverboat Dr.	w/o Hamner Av.	3.8	6.2	3.9	6.3
15	Schleisman Rd.	w/o Scholar Wy.	9.0	9.6	10.7	11.4
16	Schleisman Rd.	e/o Scholar Wy.	8.2	9.3	9.9	11.0
17	Citrus St.	w/o Hamner Av.	17.1	17.7	18.9	19.5

[1] Source: Polopolus Traffic Impact Analysis, September 2017.

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	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Source: Typical Southern California vehicle mix.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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

Classification	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways	97.42%	1.84%	0.74%	100.00%

[1] Source: Typical Southern California vehicle mix.

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 6-5. 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 6-5: 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 development of the proposed Project, noise contours were developed based on *Polopolus 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 Conditions Without / With Project: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- Opening Year 2019 Without / With the Project: This scenario refers to future year 2019 noise conditions without and with the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's traffic noise impacts on the surrounding areas, the changes in traffic noise levels on roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).

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 consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-4 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 18 study area roadway segments analyzed from both the without Project to the with Project conditions under Existing and Opening Year 2019 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the 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	Scholar Wy.	n/o Schleisman Rd.	Residential	65.5	RW	54	117
2	Scholar Wy.	s/o Schleisman Rd.	Residential	65.3	RW	53	114
3	Hamner Av.	n/o Limonite Av.	Commercial	68.8	RW	135	291
4	Hamner Av.	s/o Limonite Av.	Commercial	68.3	RW	126	272
5	Hamner Av.	s/o 68th St.	Residential	67.3	RW	109	234
6	Hamner Av.	s/o Riverboat Dr.	Residential	68.9	RW	138	298
7	Hamner Av.	s/o Schleisman Rd.	Residential	68.2	RW	125	269
8	Hamner Av.	s/o Citrus St.	Residential	69.6	RW	154	331
9	Limonite Av.	w/o Hamner Av.	Commercial	69.3	RW	147	317
10	Limonite Av.	e/o Hamner Av.	Commercial	71.0	89	191	412
11	Limonite Av.	e/o I-15 Fwy.	Commercial	70.5	82	177	381
12	68th St.	w/o Hamner Av.	Residential	65.5	RW	64	137
13	68th St.	e/o Hamner Av.	Residential	67.0	RW	81	174
14	Riverboat Dr.	w/o Hamner Av.	Residential	63.0	RW	RW	59
15	Schleisman Rd.	w/o Scholar Wy.	Residential	64.3	RW	RW	146
16	Schleisman Rd.	e/o Scholar Wy.	Residential	63.9	RW	RW	137
17	Citrus St.	w/o Hamner Av.	Residential	69.2	RW	96	206
18	Citrus St.	e/o Hamner Av.	Residential	60.3	RW	RW	52

[1] Source: City of Eastvale General Plan Land Use 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	Scholar Wy.	n/o Schleisman Rd.	Residential	65.6	RW	55	119
2	Scholar Wy.	s/o Schleisman Rd.	Residential	65.5	RW	54	117
3	Hamner Av.	n/o Limonite Av.	Commercial	68.8	RW	136	294
4	Hamner Av.	s/o Limonite Av.	Commercial	68.7	RW	134	288
5	Hamner Av.	s/o 68th St.	Residential	67.9	RW	119	257
6	Hamner Av.	s/o Riverboat Dr.	Residential	69.4	RW	148	320
7	Hamner Av.	s/o Schleisman Rd.	Residential	68.8	RW	136	292
8	Hamner Av.	s/o Citrus St.	Residential	69.8	RW	160	344
9	Limonite Av.	w/o Hamner Av.	Commercial	69.4	RW	149	321
10	Limonite Av.	e/o Hamner Av.	Commercial	71.1	91	195	421
11	Limonite Av.	e/o I-15 Fwy.	Commercial	70.5	83	178	383
12	68th St.	w/o Hamner Av.	Residential	65.7	RW	66	141
13	68th St.	e/o Hamner Av.	Residential	67.1	RW	82	176
14	Riverboat Dr.	w/o Hamner Av.	Residential	65.1	RW	38	81
15	Schleisman Rd.	w/o Scholar Wy.	Residential	64.5	RW	RW	153
16	Schleisman Rd.	e/o Scholar Wy.	Residential	64.4	RW	RW	150
17	Citrus St.	w/o Hamner Av.	Residential	69.4	RW	98	211
18	Citrus St.	e/o Hamner Av.	Residential	61.4	RW	RW	62

[1] Source: City of Eastvale General Plan Land Use 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: OPENING YEAR 2019 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	Scholar Wy.	n/o Schleisman Rd.	Residential	65.9	RW	57	123
2	Scholar Wy.	s/o Schleisman Rd.	Residential	65.9	RW	57	123
3	Hamner Av.	n/o Limonite Av.	Commercial	70.3	79	171	369
4	Hamner Av.	s/o Limonite Av.	Commercial	69.5	RW	152	327
5	Hamner Av.	s/o 68th St.	Residential	68.8	RW	136	294
6	Hamner Av.	s/o Riverboat Dr.	Residential	70.0	76	164	354
7	Hamner Av.	s/o Schleisman Rd.	Residential	69.4	RW	149	321
8	Hamner Av.	s/o Citrus St.	Residential	70.5	81	175	378
9	Limonite Av.	w/o Hamner Av.	Commercial	70.4	81	175	377
10	Limonite Av.	e/o Hamner Av.	Commercial	71.9	101	218	470
11	Limonite Av.	e/o I-15 Fwy.	Commercial	71.6	97	209	450
12	68th St.	w/o Hamner Av.	Residential	65.8	RW	67	144
13	68th St.	e/o Hamner Av.	Residential	67.7	RW	90	194
14	Riverboat Dr.	w/o Hamner Av.	Residential	63.1	RW	RW	60
15	Schleisman Rd.	w/o Scholar Wy.	Residential	65.0	RW	76	164
16	Schleisman Rd.	e/o Scholar Wy.	Residential	64.7	RW	RW	156
17	Citrus St.	w/o Hamner Av.	Residential	69.7	RW	102	220
18	Citrus St.	e/o Hamner Av.	Residential	62.3	RW	RW	72

[1] Source: City of Eastvale General Plan Land Use 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: OPENING YEAR 2019 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	Scholar Wy.	n/o Schleisman Rd.	Residential	66.0	RW	58	125
2	Scholar Wy.	s/o Schleisman Rd.	Residential	66.0	RW	58	125
3	Hamner Av.	n/o Limonite Av.	Commercial	70.3	80	172	371
4	Hamner Av.	s/o Limonite Av.	Commercial	69.8	RW	159	343
5	Hamner Av.	s/o 68th St.	Residential	69.3	RW	146	315
6	Hamner Av.	s/o Riverboat Dr.	Residential	70.4	81	174	375
7	Hamner Av.	s/o Schleisman Rd.	Residential	69.8	RW	159	342
8	Hamner Av.	s/o Citrus St.	Residential	70.7	84	181	390
9	Limonite Av.	w/o Hamner Av.	Commercial	70.5	82	177	381
10	Limonite Av.	e/o Hamner Av.	Commercial	72.0	103	222	478
11	Limonite Av.	e/o I-15 Fwy.	Commercial	71.6	97	210	452
12	68th St.	w/o Hamner Av.	Residential	66.0	RW	69	148
13	68th St.	e/o Hamner Av.	Residential	67.8	RW	91	196
14	Riverboat Dr.	w/o Hamner Av.	Residential	65.2	RW	38	82
15	Schleisman Rd.	w/o Scholar Wy.	Residential	65.3	RW	79	171
16	Schleisman Rd.	e/o Scholar Wy.	Residential	65.1	RW	78	167
17	Citrus St.	w/o Hamner Av.	Residential	69.8	RW	104	225
18	Citrus St.	e/o Hamner Av.	Residential	62.9	RW	RW	78

[1] Source: City of Eastvale General Plan Land Use 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 without Project exterior noise levels are expected to range from 60.3 to 71.0 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 61.4 to 71.1 dBA CNEL. As shown on Table 7-5 the Project will generate a noise level increase of up to 2.1 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 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

TABLE 7-5: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[2]			Threshold Exceeded?[3]
				No Project	With Project	Project Addition	
1	Scholar Wy.	n/o Schleisman Rd.	Residential	65.5	65.6	0.1	No
2	Scholar Wy.	s/o Schleisman Rd.	Residential	65.3	65.5	0.2	No
3	Hamner Av.	n/o Limonite Av.	Commercial	68.8	68.8	0.1	No
4	Hamner Av.	s/o Limonite Av.	Commercial	68.3	68.7	0.4	No
5	Hamner Av.	s/o 68th St.	Residential	67.3	67.9	0.6	No
6	Hamner Av.	s/o Riverboat Dr.	Residential	68.9	69.4	0.5	No
7	Hamner Av.	s/o Schleisman Rd.	Residential	68.2	68.8	0.5	No
8	Hamner Av.	s/o Citrus St.	Residential	69.6	69.8	0.2	No
9	Limonite Av.	w/o Hamner Av.	Commercial	69.3	69.4	0.1	No
10	Limonite Av.	e/o Hamner Av.	Commercial	71.0	71.1	0.1	No
11	Limonite Av.	e/o I-15 Fwy.	Commercial	70.5	70.5	0.0	No
12	68th St.	w/o Hamner Av.	Residential	65.5	65.7	0.2	No
13	68th St.	e/o Hamner Av.	Residential	67.0	67.1	0.1	No
14	Riverboat Dr.	w/o Hamner Av.	Residential	63.0	65.1	2.1	No
15	Schleisman Rd.	w/o Scholar Wy.	Residential	64.3	64.5	0.3	No
16	Schleisman Rd.	e/o Scholar Wy.	Residential	63.9	64.4	0.5	No
17	Citrus St.	w/o Hamner Av.	Residential	69.2	69.4	0.1	No
18	Citrus St.	e/o Hamner Av.	Residential	60.3	61.4	1.0	No

[1] Source: City of Eastvale General Plan Land Use 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.
[3] Significance Criteria (Section 4).

7.3 OPENING YEAR 2019 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Opening Year 2019 without Project conditions CNEL noise levels which are expected to range from 62.3 to 71.9 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year 2019 with Project conditions will range from 62.9 to 72.0 dBA CNEL. As shown on Table 7-6 the Project will generate a noise level increase of up to 2.1 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 Opening Year 2019 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

TABLE 7-6: OPENING YEAR 2019 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

ID	Road	Segment	Adjacent Land Use[1]	CNEL at Adjacent Land Use (dBA)[1]			Threshold Exceeded?[2]
				No Project	With Project	Project Addition	
1	Scholar Wy.	n/o Schleisman Rd.	Residential	65.9	66.0	0.1	No
2	Scholar Wy.	s/o Schleisman Rd.	Residential	65.9	66.0	0.1	No
3	Hamner Av.	n/o Limonite Av.	Commercial	70.3	70.3	0.0	No
4	Hamner Av.	s/o Limonite Av.	Commercial	69.5	69.8	0.3	No
5	Hamner Av.	s/o 68th St.	Residential	68.8	69.3	0.5	No
6	Hamner Av.	s/o Riverboat Dr.	Residential	70.0	70.4	0.4	No
7	Hamner Av.	s/o Schleisman Rd.	Residential	69.4	69.8	0.4	No
8	Hamner Av.	s/o Citrus St.	Residential	70.5	70.7	0.2	No
9	Limonite Av.	w/o Hamner Av.	Commercial	70.4	70.5	0.1	No
10	Limonite Av.	e/o Hamner Av.	Commercial	71.9	72.0	0.1	No
11	Limonite Av.	e/o I-15 Fwy.	Commercial	71.6	71.6	0.0	No
12	68th St.	w/o Hamner Av.	Residential	65.8	66.0	0.2	No
13	68th St.	e/o Hamner Av.	Residential	67.7	67.8	0.1	No
14	Riverboat Dr.	w/o Hamner Av.	Residential	63.1	65.2	2.1	No
15	Schleisman Rd.	w/o Scholar Wy.	Residential	65.0	65.3	0.3	No
16	Schleisman Rd.	e/o Scholar Wy.	Residential	64.7	65.1	0.5	No
17	Citrus St.	w/o Hamner Av.	Residential	69.7	69.8	0.1	No
18	Citrus St.	e/o Hamner Av.	Residential	62.3	62.9	0.6	No

[1] Source: City of Eastvale General Plan Land Use 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.
[3] Significance Criteria (Section 4).

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational noise and short-term construction noise and vibration impacts, the following 11 receiver locations as shown on Exhibit 8-A were identified as representative locations for focused 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, a fire station, a church, and a park, as described below. The closest sensitive receiver locations are represented by R3 and R7 to R9, at approximately 10 to 19 feet from the Project site boundaries. 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 88 feet north of the Project site, R1 represents existing outdoor living areas (backyards) of residential homes at 12653 & 12679 Thornbury Lane. A 24-hour noise level measurement, L2, and a short-term one-hour noise level measurement, S1, were taken near this location to describe the existing ambient noise environment.

R2: Location R2 represents existing outdoor living areas (backyards) of residential homes located approximately 197 feet northeast of the Project site on Hudson River Drive. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R3: Location R3 represents existing outdoor living area (backyard) of a residential home located approximately 10 feet west of the Project site at 7012 College Park Drive. A 24-hour noise level measurement, L2, and a short-term one-hour noise level measurement, S2, were taken near this location to describe the existing ambient noise environment.

R4: Location R4 represents existing outdoor living area (backyard) of a residential home located approximately 10 feet west of the Project site at 7022 College Park Drive. A 24-hour noise level measurement, L2, and a short-term one-hour noise level measurement, S2, were taken near this location to describe the existing ambient noise environment.

R5: Location R5 represents existing outdoor living area (backyard) of a residential home located approximately 10 feet west of the Project site at 7032 College Park Drive. A 24-hour noise level measurement, L2, and a short-term one-hour noise level measurement, S3, were taken near this location to describe the existing ambient noise environment.

R6: Location R6 represents existing outdoor living area (backyard) of a residential home located approximately 10 feet west of the Project site at 7042 College Park Drive. A 24-hour noise level measurement, L2, and a short-term one-hour noise level measurement, S4, were taken near this location to describe the existing ambient noise environment.

R7: Location R7 represents existing outdoor living areas (backyards) of residential homes located approximately 173 feet east of the Project site on Mackinaw Court. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R8: Location R8 represents existing fire station located approximately 146 feet south of the Project site on Hamner Avenue. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R9: Location R9 represents the existing church located approximately 537 feet west of the Project site on Schleisman Road. A 24-hour noise level measurement was taken near this location, L6, to describe the existing ambient noise environment.

R10: Location R10 represents the existing outdoor living areas (backyards) of residential homes located approximately 19 feet north of the Project site on Mississippi Drive. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

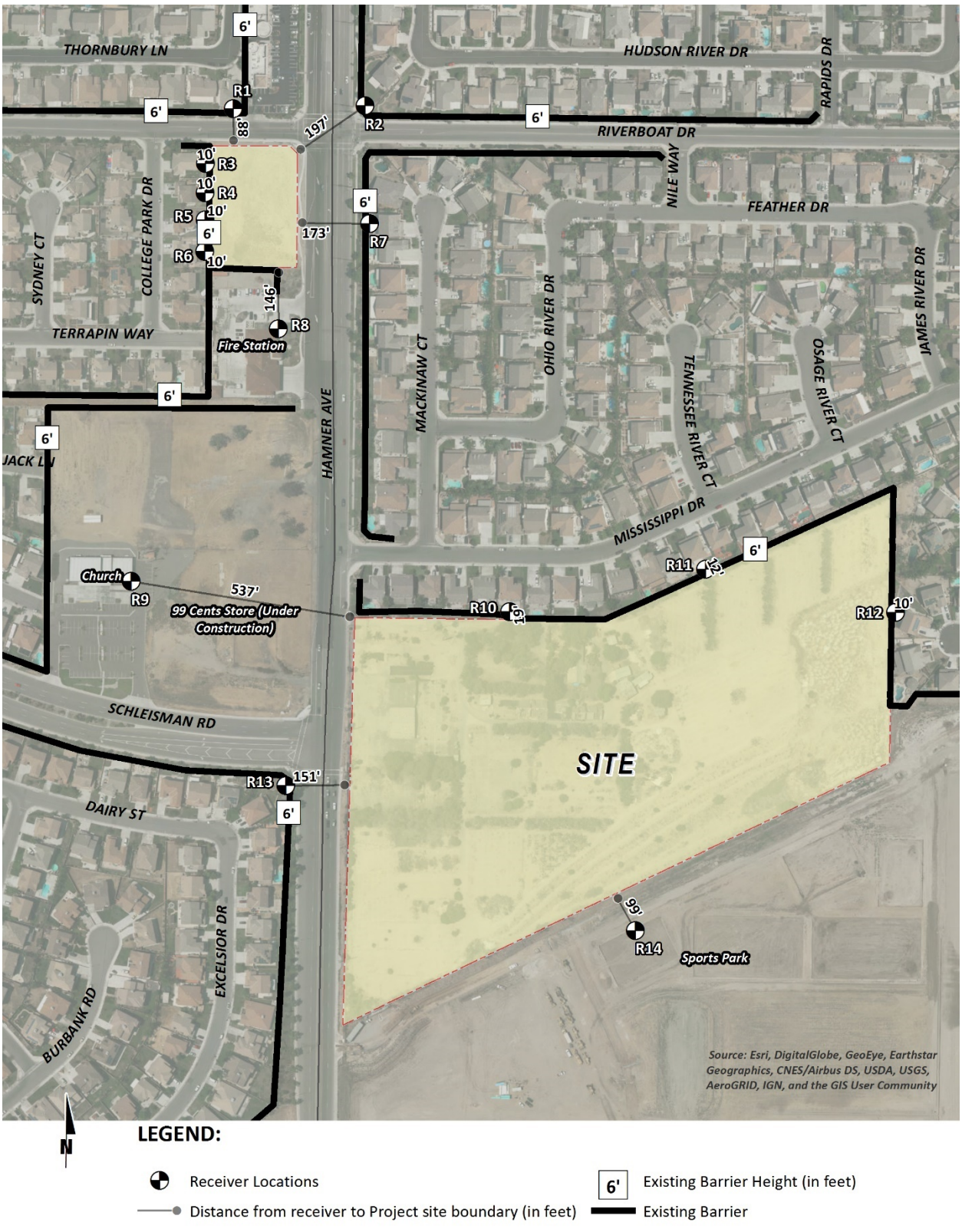
R11: Location R11 represents the existing outdoor living areas (backyards) of residential homes located approximately 12 feet north of the Project site on Mississippi Drive. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R12: Location R12 represents existing outdoor living areas (backyards) of residential homes located approximately 10 feet east of the Project site on Kern River Drive. A 24-hour noise level measurement was taken near this location, L5, to describe the existing ambient noise environment.

R13: Location R13 represents the existing outdoor living areas (backyards) residential homes located approximately 151 feet west of the Project site across Hamner Avenue. A 24-hour noise level measurement was taken near this location, L7, to describe the existing ambient noise environment.

R14: Location R14 represents the existing Silverlakes Sports Complex located approximately 99 feet south of the Project site, east of Hamner Avenue. A 24-hour noise level measurement was taken near this location, L8, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



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9 OPERATIONAL IMPACTS

This section analyzes the potential operational noise impacts due to the Project's stationary noise sources on the off-site sensitive receiver locations identified in Section 8. Exhibit 9-A identifies the receiver locations and noise source locations used to assess the Project-related operational noise levels from uses proposed in Site 1, and Exhibit 9-B shows the receiver locations and noise source locations used to evaluate the Project-related operational noise levels from the proposed car wash in Site 2.

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. It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activities within Site 1, and car wash tunnel entrance activity, tunnel exit activity, and vacuum activities within Site 2 all operating simultaneously. In reality, these noise level impacts will likely vary throughout the day and/or nighttime hours.

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins)[7]	Reference Noise Level (dBA L_{eq})	
					@ Ref. Dist.	@ 50 Feet
Site 1 Reference Noise Levels						
Roof-Top Air Conditioning Unit[1]	96:00:00	5'	5'	39	77.2	57.2
Drive-Through Speakerphone[2]	00:02:00	15'	3'	60	62.0	51.5
Parking Lot Vehicle Movements[3]	00:15:00	5'	5'	60	60.1	45.1
Gas Station Activity[4]	00:03:00	5'	5'	60	68.2	48.2
Site 2 Reference Noise Levels						
Car Wash Entrance Activity[5]	01:00:00	20'	5'	60	71.7	63.7
Car Wash Tunnel Exit (Air Blowers/Dryer)[5]	-	40'	10'	20	71.3	69.4
Car Wash Vacuum Activity[6]	00:01:02	5'	5'	60	74.6	54.6

[1] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[2] As measured by Urban Crossroads, Inc. on 12/19/2014 at a Panera Bread drive-thru in the City of Brea.
[3] As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.
[4] As measured by Urban Crossroads, Inc. on 4/26/2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine.
[5] Source: Fast5Xpress Car Wash, Motor City Wash Works reference noise level at 40 feet adjusted to reflect the observed operating time of the air blowers and dryers at the Fast5Xpress car wash in the City of Irvine on 1/23/2018.
[6] As measured by Urban Crossroads, Inc. on 5/27/2011 at an express car wash located at 1195 Baker Street in Costa Mesa.
[7] 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.

9.1.1 ROOF-TOP AIR CONDITIONING UNITS (SITE 1)

To assess the noise levels created by the roof-top air conditioning units at the Project site, 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 reference noise level noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for 39 minutes per hour during the peak hour.

9.1.2 DRIVE-THRU SPEAKERPHONE (SITE 1)

To describe the potential noise level impacts associated with potential drive-thru speakerphones and vehicle activities, a reference noise level measurement was collected on Friday, December 19th, 2014 at a Panera Bread restaurant located at 423 South Associated Road in the City of Brea. The reference noise levels collected at the Panera Bread restaurant are expected to reflect potential drive-thru speakerphone noise level activities at the Project site, since the reference measurement includes both drive-thru speakerphone and vehicle activity noise. The noise sources included in the reference noise level measurement consist of voices of the Panera Bread employees over the speakerphone, customers' voices ordering food, car engines idling, car radios playing music, and cars queuing in the drive-thru lane. At 50 feet from the speakerphone, a reference noise level of 51.5 dBA L_{eq} was measured. This reference noise level measurement overstates the actual average noise levels since it represents the average of 28 speakerphone menu board ordering events observed over a two-hour period. In other words, the Panera Bread speakerphone menu board reference noise level describes continuous drive-thru operations and does not include any periods of inactivity.

9.1.3 PARKING LOT VEHICLE MOVEMENTS (SITE 1)

To determine the noise levels associated with commercial parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30, 2012. The 15-minute noise level measurement indicates that the parking lot vehicle movements generates noise levels of 45.1 dBA L_{eq} at a normalized distance of 50 feet. The parking lot noise levels are mainly due to cars pulling in and out of spaces, car alarms sounding, and customers moving shopping carts. Noise associated with parking lot vehicle movements is expected during the entire hour (60 minutes).

9.1.4 GAS STATION ACTIVITY (SITE 1)

To describe the potential noise level impacts created by the gas station of the proposed Project uses, a reference noise level measurement was collected on Tuesday, April 26th, 2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine. The reference noise level measurement includes six cars fueling at once, car doors closing, engines starting, fuel pump TV sounds, and background car pass-by events within a 3-minute period. At a uniform reference noise level distance of 50 feet, the reference noise level is 48.2 dBA L_{eq}.

9.1.5 CAR WASH ENTRANCE ACTIVITY (SITE 2)

On January 23rd, 2018, a reference noise level measurement was taken by Urban Crossroads, Inc. at the Fast5Xpress car wash in the City of Irvine to describe the car wash tunnel entrance and vehicle movement activities at the Project site. A reference noise level of 63.7 dBA L_{eq} was measured at the uniform reference distance of 50 feet. The entirety of the reference measurement was collected over a period of 24-hours to determine the peak hour of activity, which is used as the reference noise level in this analysis to present a conservative approach. The reference noise level measurement includes vehicles queueing for the car wash tunnel, employees and customers talking, music playing in vehicles, and car wash tunnel water and soap

spraying activities. It is anticipated that the car wash entrance activity will occur for the entire hour (60 minutes) during peak conditions to present a conservative approach.

9.1.6 CAR WASH TUNNEL EXIT ACTIVITY (SITE 2)

Reference car wash tunnel noise level measurement data was provided by Fast5Xpress, the planned operator of the Site 2 car wash use, based on the planned tunnel exit air blowers and dryer equipment. The Fast5Xpress car wash equipment manufacture Motor City Wash Works indicates that the air blower and dryer noise level produce a reference noise level of 76 dBA at 40 feet under peak operating conditions. This does not account for the actual time-weighted energy average noise levels during typical daytime Project operational conditions. (24) Based on an existing Fast5Xpress car wash in the City of Irvine, the peak operating activity of the car wash tunnel air blowers and dryers at the tunnel exit were observed to operate for 20 minutes of the hour, during continuous operation. Therefore, the reference noise level shown on Table 9-1 reflects the observed operating conditions and uniform reference distance of 50 feet to result in an hourly average car wash tunnel exit reference noise level of 69.4 dBA L_{eq}. The reference noise level measurement includes five 90 horse-power car wash tunnel exit air blowers operating simultaneously, in addition to a dry-n-shine car dryer. Appendix 9.1 includes the car wash tunnel exit reference noise level specifications.

9.1.7 CAR WASH VACUUM ACTIVITY (SITE 2)

To represent the self-serve vacuums within the Project site, a reference noise level measurement was collected on May 27th, 2011 at an express car wash located at 1195 Baker Street in the City of Costa Mesa. The reference noise level measurement represents up to four vacuums operating simultaneously at the Costa Mesa express car wash. At a uniform reference distance of 50 feet, the vacuum reference noise level is 54.6 dBA L_{eq}. It is anticipated that the vacuums will operate during the entire hour of peak Project activity, as modeled in this noise study.

It is important to note that the reference car wash tunnel exit activity measurement, described in Section 9.1.6, includes background vacuum activity which may result in a doubling of vacuum-generated noise levels accounted for the operational noise analysis. However, to present a conservative approach both reference noise level measurements are used in this analysis.

9.2 SITE 1 OPERATIONAL NOISE LEVELS

Based upon the Site 1 reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each of the sensitive receiver locations adjacent to Site 1. 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 indicates that the hourly noise levels associated with Site 1 operational noise sources are expected to range from 35.5 to 47.0 dBA L_{eq} at the sensitive off-site receiver locations. The operational noise level calculation worksheets are included in Appendix 9.2.

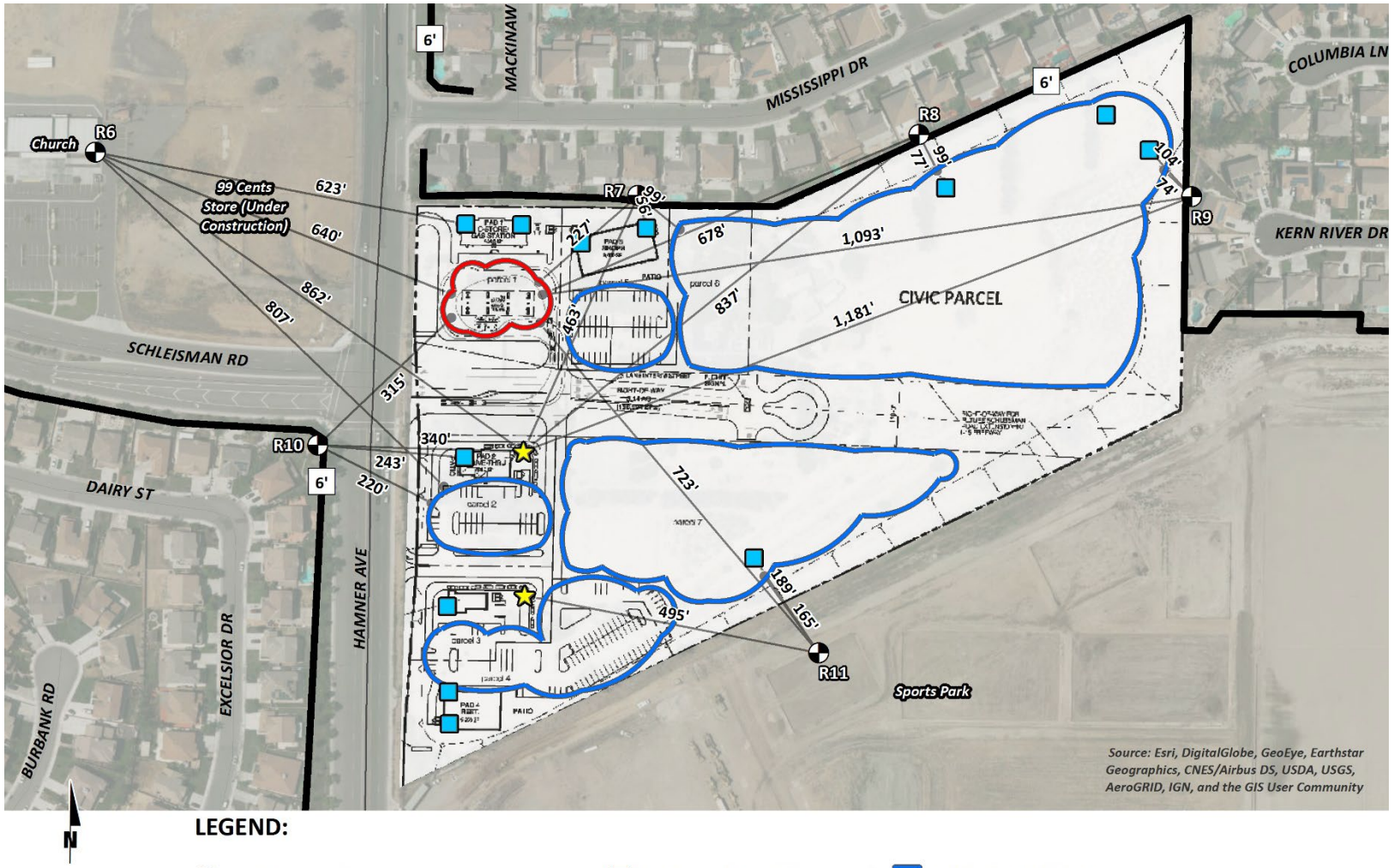
To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level threshold based on the City of Eastvale exterior noise level standards. Table 9-2 shows the operational noise levels associated with Site 1 of the Polopolus Project will satisfy the City of Eastvale 60 dBA L_{eq} daytime and 50 dBA L_{eq} nighttime exterior noise level standards at all adjacent receiver locations (R9 to R14). Receiver locations R1 to R8 are included in the Site 2 Project operational noise level analysis since they are located adjacent to Site 2.

TABLE 9-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS (SITE 1)

Receiver Location[1]	Site 1 Noise Sources[2]				Combined Site 1 Operational Noise Levels (dBA L_{eq})[3]	Threshold Exceeded?[4]	
	Roof-Top Air Conditioning Unit	Drive-Through Speakerphone	Parking Lot Vehicle Movements	Gas Station Activity		Daytime (60 dBA L_{eq})	Nighttime (50 dBA L_{eq})
R9	33.4	26.8	27.0	26.1	35.5	No	No
R10	46.6	26.7	35.2	29.6	47.0	No	No
R11	43.9	21.6	36.7	20.1	44.7	No	No
R12	43.5	18.6	36.9	15.9	44.4	No	No
R13	36.7	29.3	29.9	26.7	38.4	No	No
R14	43.8	31.6	37.3	25.0	44.9	No	No

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Calculations for each noise source are provided in Appendix 9.2.
[4] Exterior noise level standards as shown on Exhibit 3-A. Do the estimated Project operational noise source activities exceed the noise level threshold?

EXHIBIT 9-A: SITE 1 OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS



9.3 SITE 2 OPERATIONAL NOISE LEVELS

This section provides a detailed analysis of the Project operational noise levels associated with the reference Site 2 car wash activities described in Section 9.1. Exhibit 9-B shows the Site 2 operational noise sources associated with the proposed car wash.

9.3.1 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Polopolus development, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze the noise level of multiple types of noise sources and calculates the noise levels at any location using the spatially accurate Project site plan and includes the effects of topography, buildings, and multiple barriers in its calculations using the latest standards to predict outdoor noise impacts.

Using the spatially accurate Project site plan and flown aerial imagery from Google Earth, a CadnaA noise prediction model of the Project study area was developed. The noise model provides a three-dimensional representation of the Project study area using the following key data inputs:

- Ground absorption (hard site conditions);
- Reflections at all buildings and barriers;
- Reference noise level sources by type (e.g., area, point, etc.);
- Reference noise source geometry;
- Multiple noise receiver locations and heights;
- Existing barrier attenuation.

Based on these data inputs, the CadnaA noise prediction model will calculate the distance from each noise source to the receiver locations, in addition to the ground absorption, distance, and barrier/building attenuation to provide a summary of noise level calculations at each receiver location, and the partial noise level contributions by each noise source. The reference sound power level (PWL) for each noise source is used in the CadnaA noise prediction model. While sound pressure levels (e.g. L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. 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. Appendix 9.3 includes the CadnaA noise model inputs and calculation data.

9.3.2 SITE 2 UNMITIGATED OPERATIONAL NOISE LEVELS

Table 9-3 indicates that the hourly noise levels associated with Site 2 operational noise sources are expected to range from 47.2 to 59.4 dBA L_{eq} at sensitive off-site receiver locations R1 to R8, including backyard, first-floor and second-floor building façades at the closest receiver locations to the car wash, R1 and R3 to R6. To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level threshold based on the City of Eastvale exterior noise level standards.

Table 9-3 shows the unmitigated operational noise levels associated with Site 1 of the Polopolus Project will remain below the City of Eastvale 60 dBA L_{eq} daytime exterior noise level standards at all the nearby sensitive receiver locations. However, the received car wash noise levels would exceed the 50 dBA L_{eq} nighttime (10:00 p.m. to 7:00 a.m.) exterior noise level standard at locations nearest the Site 2 car wash (R1 and R3 to R6). This is a *potentially significant* impact. Therefore, to satisfy the City of Eastvale nighttime noise standards, Noise mitigation measure NOI-1 requires that car wash activity be limited to the daytime hours between (7:00 a.m. and 10:00 p.m.). With application of mitigation measure NOI-1 impacts at receiver locations R1 and R3 to R6 would be *less than significant*.

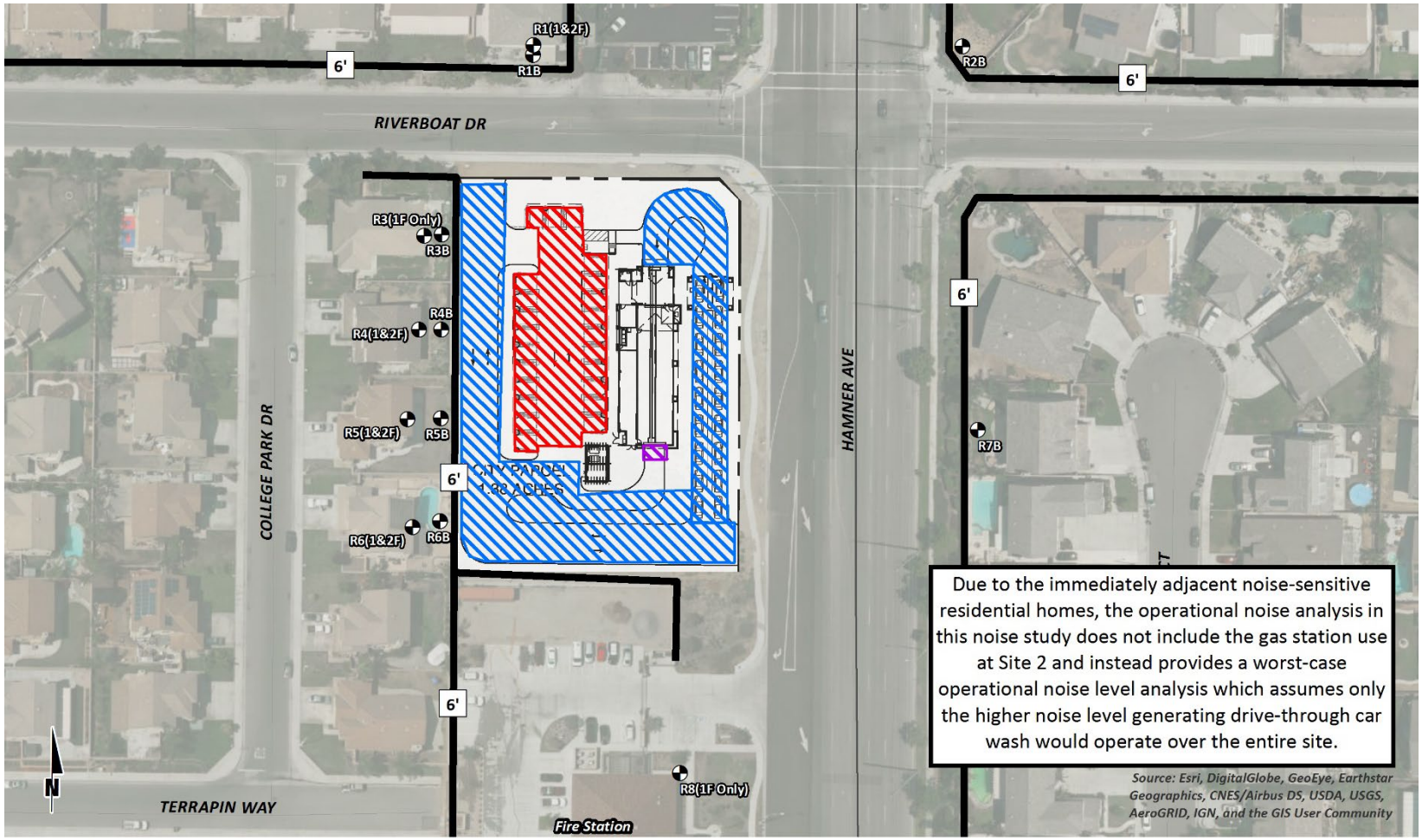
NOI-1 No car wash activities shall be permitted during the nighttime hours of 10:00 p.m. to 7:00 a.m.

TABLE 9-3: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS (SITE 2)

Receiver Location[1]		Site 2 Noise Sources[2]			Combined Site 2 Operational Noise Levels (dBA L_{eq})[3]	Noise Level Standard (dBA L_{eq})[4]		Threshold Exceeded?[5]	
ID	Location	Car Wash Entrance Activity	Car Wash Tunnel Exit	Car Wash Vacuum Activity		Daytime	Nighttime	Daytime	Nighttime
R1	Backyard	50.4	31.5	40.2	50.8	60	50	No	**Yes**
R2		47.0	29.5	31.0	47.2	60	50	No	No
R3		56.1	34.5	45.1	56.4	60	50	No	**Yes**
R4		56.6	36.1	46.3	57.0	60	50	No	**Yes**
R5		56.5	36.7	45.4	56.8	60	50	No	**Yes**
R6		56.3	54.2	41.9	58.5	60	50	No	**Yes**
R7		49.7	34.4	24.1	49.8	60	50	No	No
R8		50.7	50.9	33.7	53.9	60	50	No	**Yes**
R1	First-Floor Building Façade	48.1	29.0	37.9	48.6	60	50	No	No
R2		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]
R3		53.3	32.3	42.9	53.7	60	50	No	**Yes**
R4		53.6	33.5	43.9	54.1	60	50	No	**Yes**
R5		53.1	33.8	42.9	53.6	60	50	No	**Yes**
R6		53.0	51.7	40.6	55.5	60	50	No	**Yes**
R7		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]
R8		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]
R1	Second-Floor Building Façade	53.1	33.5	42.9	53.5	60	50	No	**Yes**
R2		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]
R3		-[7]	-[7]	-[7]	-[7]	-[7]	-[7]	-[7]	-[7]
R4		57.7	43.3	48.8	58.3	60	50	No	**Yes**
R5		56.7	51.7	47.7	58.3	60	50	No	**Yes**
R6		57.1	54.9	45.4	59.4	60	50	No	**Yes**
R7		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]
R8		-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]	-[6]

[1] See Exhibit 9-B for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 9-1.
[3] Calculations for each noise source are provided in Appendix 9.3.
[4] Exterior noise level standards as shown on Exhibit 3-A.
[5] Do the estimated Project operational noise source activities exceed the noise level threshold?
[6] Receiver locations R2, R7, and R8 are located further from the Project site than those residential homes directly adjacent to the Project Site 2 car wash, and as such, are excluded from the extra building facade analysis for residential homes immediately adjacent to the Project.
[7] Single-story residential home (without a second-floor building facade for this analysis).

EXHIBIT 9-B: SITE 2 OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS

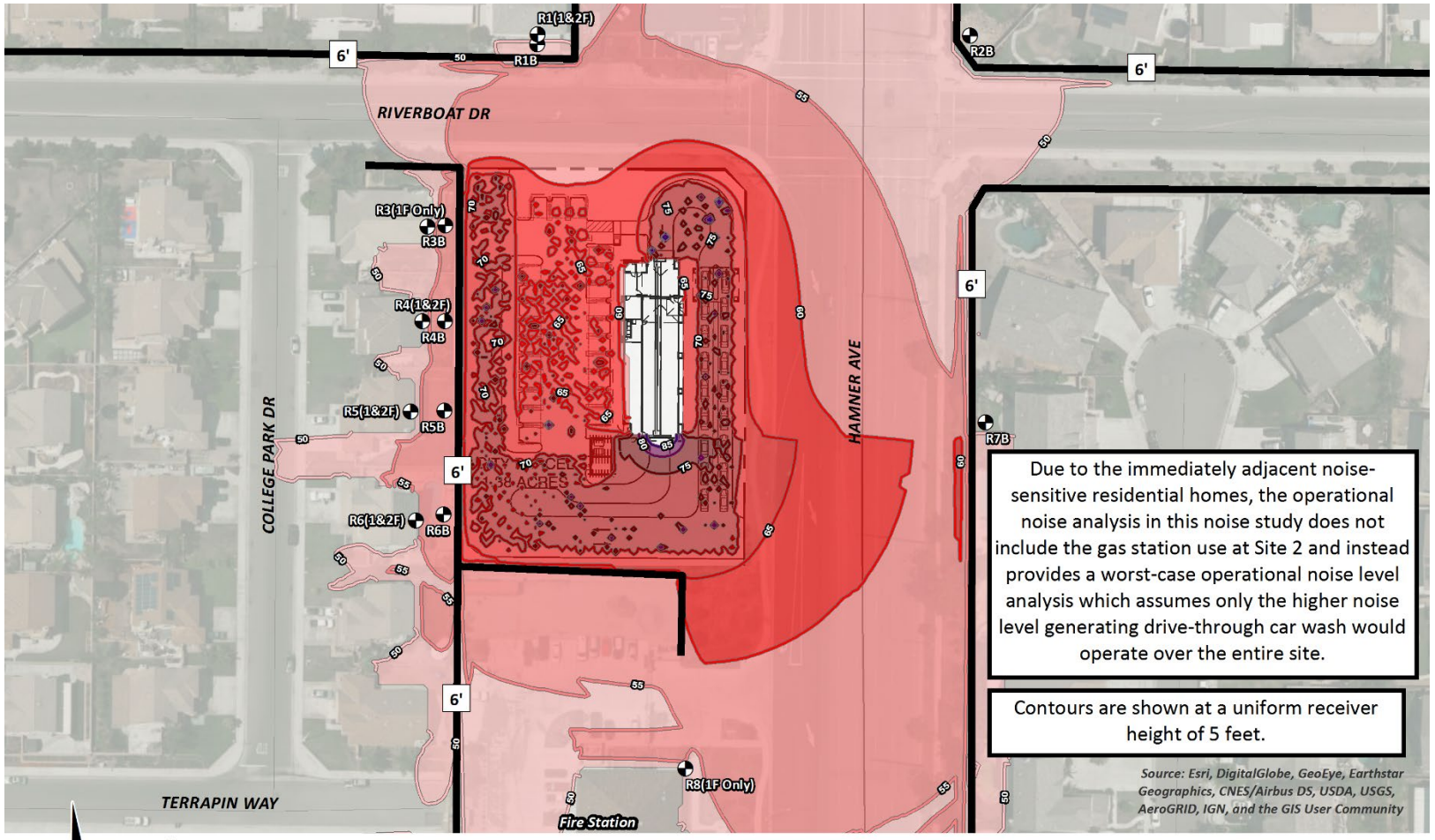


LEGEND:

- Receiver Locations
- 6' Existing Barrier Height (in feet)
- Existing Barrier
- Car Wash Entrance & Vehicle Activity
- Car Wash Tunnel Exit
- Car Wash Vacuum Activity

"B" = Backyard Receiver Location
"(1F Only)" = Single-Story Building and First-Floor Building Facade Receiver Location
"(1&2F)" = First and Second-Floor Building Facade Receiver Location

EXHIBIT 9-C: SITE 2 UNMITIGATED OPERATIONAL NOISE LEVEL CONTOURS



9.4 PROJECT OPERATIONAL NOISE CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels were combined with the existing ambient noise levels measurements for the off-site 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. Project operational noise level contributions to the existing ambient noise environment are analyzed under the following scenarios:

Daytime

- Without and with Project Site 1 and 2 operational noise levels at outdoor living areas (backyards) and first-floor building façades;
- Without and with Project Site 2 (car wash) operational noise levels at first and second-floor building façades closest to the car wash use.

Nighttime

- Without and with Project Site 1 operational noise levels at outdoor living areas (backyards) and first-floor building façades (no Site 2 car wash activities shall be permitted to operate during nighttime hours as a part of Project operational noise mitigation).

9.4.1 DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES (SITES 1 & 2)

As indicated on Table 9-4, the Project will contribute an operational noise level increase during the daytime hours ranging from 0.0 to 4.9 dBA L_{eq}. Based on the significance criteria described in Section 4, the highest unmitigated Project-related operational noise level increases of 4.9 dBA L_{eq} during the daytime hours at receiver location R6 represents a *less than significant* noise level impact when the without Project conditions are below 60 dBA L_{eq}.

9.4.2 NIGHTTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES (SITE 1)

Since Site 2 car wash uses will be prohibited to operate during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m., as previously described in Section 9.3, the nighttime Project-only operational noise level increases described in this section appropriately do not include any nighttime noise level increases at receiver locations R1 to R8 adjacent to Site 2.

During the nighttime hours, Project-only operational noise level contributions are shown to range between 0.0 to 0.3 dBA L_{eq} at receiver locations R9 to R14 near Site 1. Based on the significance criteria described in Section 4, the highest unmitigated Project-related operational noise level

increases of 0.3 dBA L_{eq} during the nighttime hours represents a *less than significant* noise level impact.

TABLE 9-4: UNMITIGATED DAYTIME OPERATIONAL NOISE LEVEL INCREASES (SITES 1 & 2)

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{eq})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{eq})[4]	Combined Project and Ambient (dBA L_{eq})[5]	Project Contribution (dBA L_{eq})[6]	Threshold Exceeded?[7]
R1	50.8	S1	58.9	59.5	0.6	No
R2	47.2	L1	79.9	79.9	0.0	No
R3	56.4	S2	57.1	59.8	2.7	No
R4	57.0	S2	57.1	60.1	3.0	No
R5	56.8	S3	56.0	59.5	3.5	No
R6	58.5	S4	55.2	60.1	4.9	No
R7	49.8	L3	61.3	61.6	0.3	No
R8	53.9	L3	61.3	62.0	0.7	No
R9	35.5	L6	60.5	60.5	0.0	No
R10	47.0	L4	58.9	59.2	0.3	No
R11	44.7	L4	58.9	59.1	0.2	No
R12	44.4	L5	59.2	59.3	0.1	No
R13	38.4	L7	71.1	71.1	0.0	No
R14	44.9	L8	71.8	71.8	0.0	No

[1] See Exhibits 9-A and 9-B for the sensitive receiver locations.
[2] Unmitigated Project operational noise levels as shown on Tables 9-2 and 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 and 5-2.
[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: UNMITIGATED NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES (SITE 1)

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{eq})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{eq})[4]	Combined Project and Ambient (dBA L_{eq})[5]	Project Contribution (dBA L_{eq})[6]	Threshold Exceeded?[7]
R9	35.5	L6	56.6	56.6	0.0	No
R10	47.0	L4	58.4	58.7	0.3	No
R11	44.7	L4	58.4	58.6	0.2	No
R12	44.4	L5	59.8	59.9	0.1	No
R13	38.4	L7	65.6	65.6	0.0	No
R14	44.9	L8	68.2	68.2	0.0	No

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

9.4.3 SITE 2 PROJECT OPERATIONAL NOISE LEVEL INCREASES AT FIRST-FLOOR BUILDING FAÇADES

This section identifies the Project-only operational noise level increases over existing ambient conditions at the first-floor building façades of receiver locations adjacent to Site 2: R1, and R3 to R6. As indicated on Table 9-6, the Project will contribute an operational noise level increase during the daytime hours ranging from 0.4 to 3.2 dBA L_{eq}. Based on the significance criteria described in Section 4, the highest unmitigated Project-related operational noise level increases of 3.2 dBA L_{eq} during the daytime hours at the first-floor building façade of receiver location R6 represents a *less than significant* noise level impact when the without Project conditions are below 60 dBA L_{eq}.

9.4.4 SITE 2 PROJECT OPERATIONAL NOISE LEVEL INCREASES AT SECOND-FLOOR BUILDING FAÇADES

This section identifies the Project-only operational noise level increases over existing ambient conditions at the second-floor building façades of receiver locations adjacent to Site 2: R1, and R4 to R6. Receiver location R3 is a single-story residential home at 7012 College Park Drive and is therefore excluded from the second-floor building façade analysis. As indicated on Table 9-7, the Project will contribute an operational noise level increase during the daytime hours ranging from 1.3 to 6.2 dBA L_{eq}. The Project-source incremental contribution to the ambient noise condition at receiver location R6, second-floor building façade, would approximate to 6.2 dBA L_{eq}. In the context of the ambient noise condition (54.4 dBA L_{eq}), this is a *potentially significant* impact. At the affected second floor receiver location, a physical noise barrier exceeding 14 feet would be required to ensure that the increment of received noise would not exceed 5 dBA, and therefore be less than significant. Construction of such a barrier would of itself result in land use and aesthetic incompatibilities; and from a pragmatic perspective would cost-prohibitive. It is therefore considered infeasible to fully mitigate operational-source noise impacts at the

potentially affected R6 receiver location. The increase in ambient noise conditions at receiver R6 (second-floor façade) would exceed 5 dBA, and the incremental increase in the ambient noise condition would be *significant and unavoidable*. Notwithstanding, it is recommended the following noise-reducing design features be considered, and where feasible, incorporated in the final car wash building site plan designs:

- Maximize the distance between noise sources and off-site receptors;
- Incorporate parapet walls where appropriate; and
- Incorporate on-site noise barriers, landscaping, or similar physical features that would act to generally attenuate noise emanating from the car wash site.

Under all scenarios and at all other receiver locations, Project-source contributions to ambient noise conditions would be *less than significant*.

9.4.5 SITE 2 PROJECT OPERATIONAL NOISE LEVEL INCREASE PERCEPTION

The Project operational noise level increase of up to 6.2 dBA L_{eq} represents a *readily perceptible* noise level increase that would be experienced at the second-floor building façade of an existing residential home represented by receiver location R6. This second-floor receiver location will have a direct line-of-sight to the car wash exit tunnel, and as a result, experiences the highest Project-related operational noise level contribution to the existing ambient noise environment. Typical residential building construction materials would reduce these exterior noise levels in interior spaces under "windows-closed" conditions. However, should windows be open during Project operation in any of the residential homes represented by receiver locations R1 and R3 to R6, the noise-sensitive residential receivers are likely to experience *barely* to *readily perceptible* noise level increases because of Project-only operational noise level contributions to the existing noise environment.

TABLE 9-6: SITE 2 OPERATIONAL NOISE LEVEL INCREASES (FIRST-FLOOR)

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{eq})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{eq})[4]	Combined Project and Ambient (dBA L_{eq})[5]	Project Contribution (dBA L_{eq})[6]	Threshold Exceeded?[7]
R1	48.6	S1	58.9	59.3	0.4	No
R3	53.7	S2	57.1	58.7	1.6	No
R4	54.1	S2	57.1	58.9	1.8	No
R5	53.6	S3	56.0	58.0	2.0	No
R6	55.5	S4	55.2	58.4	3.2	No

[1] See Exhibits 9-B for the sensitive receiver locations.
[2] Unmitigated Project operational noise levels as shown on Tables 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 9-7: SITE 2 OPERATIONAL NOISE LEVEL INCREASES (SECOND-FLOOR)

Receiver Location[1]	Total Project Operational Noise Level (dBA L_{eq})[2]	Measurement Location[3]	Reference Ambient Noise Levels (dBA L_{eq})[4]	Combined Project and Ambient (dBA L_{eq})[5]	Project Contribution (dBA L_{eq})[6]	Threshold Exceeded?[7]
R1	53.5	S1	58.1	59.4	1.3	No
R3	-[8]	-[8]	-[8]	-[8]	-[8]	-[8]
R4	58.3	S2	56.3	60.4	4.1	No
R5	58.3	S3	55.2	60.0	4.8	No
R6	59.4	S4	54.4	60.6	6.2	Yes

[1] See Exhibits 9-B for the sensitive receiver locations.
[2] Unmitigated Project operational noise levels as shown on Tables 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.
[8] Single-story residential home (without a second-floor building facade for this analysis).

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 activity boundaries in relation to the nearby sensitive receiver locations.

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:

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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 62 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the data used to support the construction emissions in the *Polopolus Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (25)

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 17-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	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[7]
1	Truck Pass-bys & Dozer Activity[1]	30'	63.6	59.2
2	Dozer Activity[1]	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	67.5
4	Foundation Trenching[2]	30'	72.6	68.2
5	Rough Grading Activities[2]	30'	77.9	73.5
6	Framing[3]	30'	66.7	62.3
7	Water Truck Pass-By & Backup Alarm[4]	30'	76.3	71.9
8	Dozer Pass-By[4]	30'	84.0	79.6
9	Two Scrapers & Water Truck Pass-By[4]	30'	83.4	79.0
10	Two Scrapers Pass-By[4]	30'	83.7	79.3
11	Scraper, Water Truck, & Dozer Activity[4]	30'	79.7	75.3
12	Concrete Mixer Truck Movements[5]	50'	71.2	71.2
13	Concrete Paver Activities[5]	30'	70.0	65.6
14	Concrete Mixer Pour & Paving Activities[5]	30'	70.3	65.9
15	Concrete Mixer Backup Alarms & Air Brakes[5]	50'	71.6	71.6
16	Concrete Mixer Pour Activities[5]	50'	67.7	67.7
17	Forklift, Jackhammer, & Metal Truck Bed Loading	50'	67.9	67.9

[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] As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing parking lot at 41 Corporate Park in Irvine.
[7] 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 shown on Exhibit 10-A. Based on the reference construction noise levels, the Project-related construction noise levels when the highest reference noise level is operating at a single point nearest the sensitive receiver location from primary construction activity will range from 58.4 to 79.1 dBA L_{eq} at the sensitive receiver locations. Exhibit 10-A shows the construction activity noise source location and the distance to each nearby sensitive receiver location.

TABLE 10-2: DEMOLITION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Forklift, Jackhammer, & Metal Truck Bed Activities	67.9
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.9

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	56.7
R2	215'	-12.7	-4.9	50.3
R3	30'	4.4	-4.9	67.4
R4	30'	4.4	-4.9	67.4
R5	30'	4.4	-4.9	67.4
R6	30'	4.4	-4.9	67.4
R7	186'	-11.4	-4.9	51.6
R8	161'	-10.2	0.0	57.7
R9	570'	-21.1	0.0	46.8
R10	48'	0.4	-5.5	62.8
R11	64'	-2.1	-5.5	60.3
R12	73'	-3.3	-5.5	59.1
R13	176'	-10.9	-5.5	51.5
R14	161'	-10.2	0.0	57.7

[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] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

TABLE 10-3: SITE PREPARATION EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	68.4
R2	215'	-12.7	-4.9	62.0
R3	30'	4.4	-4.9	79.1
R4	30'	4.4	-4.9	79.1
R5	30'	4.4	-4.9	79.1
R6	30'	4.4	-4.9	79.1
R7	186'	-11.4	-4.9	63.3
R8	161'	-10.2	0.0	69.4
R9	570'	-21.1	0.0	58.4
R10	48'	0.4	-5.5	74.4
R11	64'	-2.1	-5.5	71.9
R12	73'	-3.3	-5.5	70.8
R13	176'	-10.9	-5.5	63.1
R14	161'	-10.2	0.0	69.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

TABLE 10-4: GRADING EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	68.4
R2	215'	-12.7	-4.9	62.0
R3	30'	4.4	-4.9	79.1
R4	30'	4.4	-4.9	79.1
R5	30'	4.4	-4.9	79.1
R6	30'	4.4	-4.9	79.1
R7	186'	-11.4	-4.9	63.3
R8	161'	-10.2	0.0	69.4
R9	570'	-21.1	0.0	58.4
R10	48'	0.4	-5.5	74.4
R11	64'	-2.1	-5.5	71.9
R12	73'	-3.3	-5.5	70.8
R13	176'	-10.9	-5.5	63.1
R14	161'	-10.2	0.0	69.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

TABLE 10-5: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	57.0
R2	215'	-12.7	-4.9	50.6
R3	30'	4.4	-4.9	67.7
R4	30'	4.4	-4.9	67.7
R5	30'	4.4	-4.9	67.7
R6	30'	4.4	-4.9	67.7
R7	186'	-11.4	-4.9	51.9
R8	161'	-10.2	0.0	58.0
R9	570'	-21.1	0.0	47.0
R10	48'	0.4	-5.5	63.0
R11	64'	-2.1	-5.5	60.5
R12	73'	-3.3	-5.5	59.4
R13	176'	-10.9	-5.5	51.7
R14	161'	-10.2	0.0	58.0

[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] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

TABLE 10-6: PAVING EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	60.4
R2	215'	-12.7	-4.9	54.0
R3	30'	4.4	-4.9	71.1
R4	30'	4.4	-4.9	71.1
R5	30'	4.4	-4.9	71.1
R6	30'	4.4	-4.9	71.1
R7	186'	-11.4	-4.9	55.3
R8	161'	-10.2	0.0	61.4
R9	570'	-21.1	0.0	50.5
R10	48'	0.4	-5.5	66.5
R11	64'	-2.1	-5.5	64.0
R12	73'	-3.3	-5.5	62.8
R13	176'	-10.9	-5.5	55.2
R14	161'	-10.2	0.0	61.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

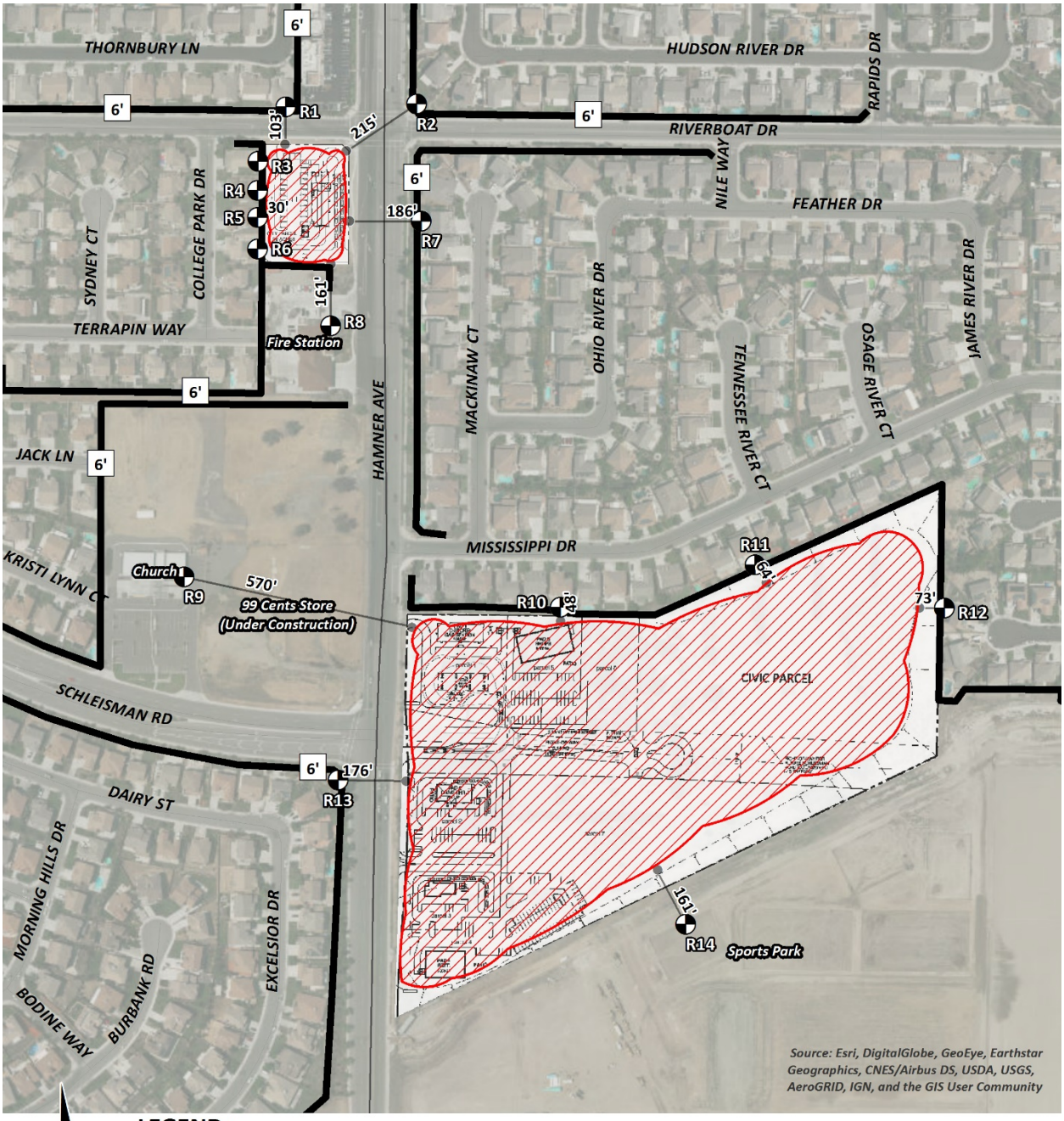
TABLE 10-7: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	103'	-6.3	-4.9	56.3
R2	215'	-12.7	-4.9	49.9
R3	30'	4.4	-4.9	67.0
R4	30'	4.4	-4.9	67.0
R5	30'	4.4	-4.9	67.0
R6	30'	4.4	-4.9	67.0
R7	186'	-11.4	-4.9	51.2
R8	161'	-10.2	0.0	57.3
R9	570'	-21.1	0.0	46.3
R10	48'	0.4	-5.5	62.3
R11	64'	-2.1	-5.5	59.8
R12	73'	-3.3	-5.5	58.7
R13	176'	-10.9	-5.5	51.0
R14	161'	-10.2	0.0	57.3

[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] Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.2).

EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



10.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the edge of primary construction activity. As shown on Table 10-8, the unmitigated construction noise levels are expected to range from 58.4 to 79.1 dBA L_{eq} at the sensitive receiver locations.

TABLE 10-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Unmitigated Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Levels[2]
R1	56.7	68.4	68.4	57.0	60.4	56.3	68.4
R2	50.3	62.0	62.0	50.6	54.0	49.9	62.0
R3	67.4	79.1	79.1	67.7	71.1	67.0	79.1
R4	67.4	79.1	79.1	67.7	71.1	67.0	79.1
R5	67.4	79.1	79.1	67.7	71.1	67.0	79.1
R6	67.4	79.1	79.1	67.7	71.1	67.0	79.1
R7	51.6	63.3	63.3	51.9	55.3	51.2	63.3
R8	57.7	69.4	69.4	58.0	61.4	57.3	69.4
R9	46.8	58.4	58.4	47.0	50.5	46.3	58.4
R10	62.8	74.4	74.4	63.0	66.5	62.3	74.4
R11	60.3	71.9	71.9	60.5	64.0	59.8	71.9
R12	59.1	70.8	70.8	59.4	62.8	58.7	70.8
R13	51.5	63.1	63.1	51.7	55.2	51.0	63.1
R14	57.7	69.4	69.4	58.0	61.4	57.3	69.4

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

Table 10-9 shows the highest construction noise levels at the potentially impacted receiver locations approaching 79.1 dBA L_{eq} will satisfy the NIOSH 85 dBA L_{eq} significance threshold during temporary Project construction activities.

TABLE 10-9: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Unmitigated Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Level[2]	Threshold[3]	Threshold Exceeded?[4]
R1	68.4	85	No
R2	62.0	85	No
R3	79.1	85	No
R4	79.1	85	No
R5	79.1	85	No
R6	79.1	85	No
R7	63.3	85	No
R8	69.4	85	No
R9	58.4	85	No
R10	74.4	85	No
R11	71.9	85	No
R12	70.8	85	No
R13	63.1	85	No
R14	69.4	85	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Estimated construction noise levels during peak operating conditions, as shown on Table 10-8.
[3] Construction noise level threshold as shown on Table 4-2.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 CONSTRUCTION NOISE LEVEL INCREASES

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. The difference between the combined Project-construction and ambient noise levels are used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when Project construction-source noise is added to the ambient daytime conditions are presented on Table 10-10. A temporary noise level increase of 12 dBA L_{eq} is considered a potentially significant impact based on the Caltrans substantial noise level increase criteria which is used to assess the Project-construction noise level increases. (3) No nighttime construction activity is permitted in the City of Eastvale Municipal Code, and therefore, nighttime noise level increases are not analyzed in this noise study.

As indicated in Table 10-10, the Project will contribute unmitigated, worst-case construction noise level increases between 0.1 to 23.9 dBA L_{eq} at the adjacent sensitive receiver locations during the daytime hours. Due to the magnitude of the worst-case temporary noise level increases during Project construction activities which are shown to exceed the 12 dBA L_{eq} significance threshold at receiver locations R3 to R6, R10, and R11, the unmitigated construction-source noise level increases are therefore considered *potentially significant*. Construction noise

mitigation measures (NOI-2 and NOI-3) identified in the Executive Summary would generally and qualitatively reduce Project construction-source noise impacts. However, even with application of these measures and the Municipal Code construction hour limitations, it is anticipated the Project construction-source noise received at proximate receptors would exceed 12 dBA L_{eq}. Project construction-source noise impacts are therefore recognized as *significant and unavoidable*.

TABLE 10-10: UNMITIGATED CONSTRUCTION TEMPORARY NOISE LEVEL INCREASES

Receiver Location[1]	Highest Project Construction Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Temporary Worst-Case Project Contribution[6]	Threshold Exceeded?[7]
R1	68.4	S1	58.9	68.8	9.9	No
R2	62.0	L1	79.9	80.0	0.1	No
R3	79.1	S2	57.1	79.1	22.0	Yes
R4	79.1	S2	57.1	79.1	22.0	Yes
R5	79.1	S3	56.0	79.1	23.1	Yes
R6	79.1	S4	55.2	79.1	23.9	Yes
R7	63.3	L3	61.3	65.4	4.1	No
R8	69.4	L3	61.3	70.0	8.7	No
R9	58.4	L6	60.5	62.6	2.1	No
R10	74.4	L4	58.9	74.5	15.6	Yes
R11	71.9	L4	58.9	72.1	13.2	Yes
R12	70.8	L5	59.2	71.1	11.9	No
R13	63.1	L7	71.1	71.7	0.6	No
R14	69.4	L8	71.8	73.8	2.0	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest unmitigated Project construction noise levels as shown on Table 10-9.
[3] Ambient 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 construction activities.
[6] The temporary noise level increase expected with the addition of the proposed Project activities.
[7] Based on the 12 dBA temporary increase significance criteria as defined in Section 4.

10.6 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 building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-5 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-11 presents the unmitigated Project construction-related vibration levels at each of the sensitive 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 30 to 570 feet from the Project construction activities, construction vibration velocity levels are expected to range from 0.001 to 0.068 in/sec PPV, as shown on Table 10-11. Based on the City of Eastvale vibration standard of 0.0787 in/sec PPV, the proposed Project construction activities will generate unmitigated vibration levels which remain below the 0.0787 in/sec PPV threshold, and therefore, represents a *less than significant* impact.

TABLE 10-13: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance To Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Highest Levels (PPV)	
R1	103'	0.0004	0.0042	0.0091	0.0106	0.0106	No
R2	215'	0.0001	0.0014	0.0030	0.0035	0.0035	No
R3	30'	0.0023	0.0266	0.0578	0.0677	0.0677	No
R4	30'	0.0023	0.0266	0.0578	0.0677	0.0677	No
R5	30'	0.0023	0.0266	0.0578	0.0677	0.0677	No
R6	30'	0.0023	0.0266	0.0578	0.0677	0.0677	No
R7	186'	0.0001	0.0017	0.0037	0.0044	0.0044	No
R8	161'	0.0002	0.0021	0.0047	0.0054	0.0054	No
R9	570'	0.0000	0.0003	0.0007	0.0008	0.0008	No
R10	48'	0.0011	0.0132	0.0286	0.0335	0.0335	No
R11	64'	0.0007	0.0085	0.0186	0.0217	0.0217	No
R12	73'	0.0006	0.0070	0.0152	0.0178	0.0178	No
R13	176'	0.0002	0.0019	0.0041	0.0048	0.0048	No
R14	161'	0.0002	0.0021	0.0047	0.0054	0.0054	No

[1] Receiver locations are shown on Exhibit 10-A.

[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-5.

[3] Does the peak vibration exceed the maximum acceptable vibration threshold shown on Table 3-1?

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2016.
2. **Urban Crossroads, Inc.** *Polopolus Traffic Impact Analysis.* September 2017.
3. **California Department of Transportation.** *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects.* May 2011.
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.
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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. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
12. **Office of Planning and Research.** *State of California General Plan Guidlines 2003.* October 2003.
13. **State of California.** *2013 California Green Building Standards Code.* January 2014.
14. **City of Eastvale.** *General Plan Noise Element.* June 2012.
15. —. *Municipal Code, Section 8.52.020.*
16. **National Institute for Occupational Safety and Health.** *Criteria for Recommended Standard: Occupational Noise Exposure.* June 1998.
17. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
18. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
19. **Superior Court of California, County of Riverside.** *Friends of Riverside's Hills v. Riverside Transportation Commission, et al.* RIC 1113896, January 2013.
20. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
21. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.

22. **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.

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

24. **Motor City Wash Works.** *90 Horsepower Profiler Plus Dry-N-Shine Sound Study.* April 2017.

25. **Urban Crossroads, Inc.** *Polopolus Air Quality Impact Analysis.* January 2018.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Polopolus 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.
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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 EASTVALE MUNICIPAL CODE

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CHAPTER 8.52. - NOISE REGULATION

Sec. 8.52.010. - Reserved.

Sec. 8.52.020. - Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

(1) Facilities owned or operated by or for a governmental agency;

(2) Capital improvement projects of a governmental agency;

(3) The maintenance or repair of public properties;

(4) Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

(5) Public or private schools and school-sponsored activities;

(6) Agricultural operations on land designated agriculture in the city general plan, or land zoned A-l (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), A-D (agriculture-dairy) or C/V (citrus/vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;

(7) Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of county Ordinance No. 348;

(8) Private construction projects located one-quarter of a mile or more from an inhabited dwelling;

(9) Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that construction does not occur between the hours of:

a. 6:00 p.m. and 6:00 a.m. during the months of June through September; and

b. 6:00 p.m. and 7:00 a.m. during the months of October through May;

(10) Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7:00 a.m. and 8:00 p.m.;

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

(12) Heating and air conditioning equipment;

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

(14) The discharge of firearms consistent with all state laws.

(Ord. No. 2011-04, §§ 1, 2, 1-26-2011)

Sec. 8.52.030. - Definitions.

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

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

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

(1) The term, "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

(2) The term "maximum sound level (Lmax)" means the maximum sound level measured on a sound level meter.

Governmental agency means the United States, the state, the county, any city within the county, any special district within the county or any combination of these agencies.

Land use permit means a discretionary permit issued by the city pursuant to title 120 (planning and zoning) of this Code.

Motor vehicle means a vehicle that is self-propelled.

Motor vehicle sound system means a stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device in a motor vehicle.

Noise means any loud, discordant or disagreeable sound.

Occupied property means property upon which is located a residence, business or industrial or manufacturing use.

Off-highway vehicle means a motor vehicle designed to travel over any terrain.

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APPENDIX 5.1:

STUDY AREA PHOTOS

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L1_N
33, 57' 40.300000", 117, 33' 28.990000"

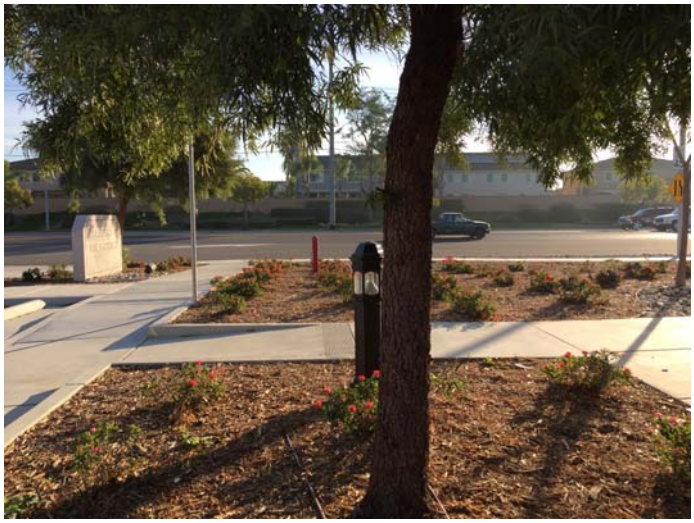
L1_S
33, 57' 40.300000", 117, 33' 28.990000"

L1_W
33, 57' 40.280000", 117, 33' 29.210000"

L2_E
33, 57' 38.910000", 117, 33' 33.900000"

L2_N
33, 57' 38.940000", 117, 33' 33.900000"

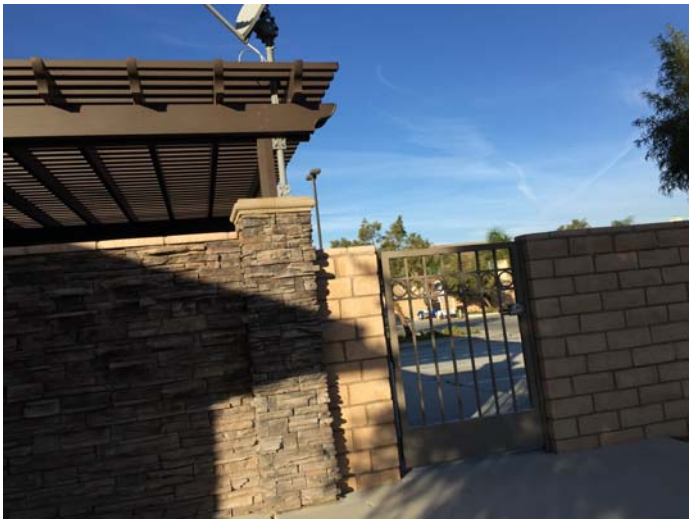
L2_W
33, 57' 38.940000", 117, 33' 33.900000"



L3_E
33, 57' 34.620000", 117, 33' 31.620000"

L3_N
33, 57' 34.640000", 117, 33' 31.600000"

L3_S
33, 57' 34.490000", 117, 33' 32.090000"



L3_W
33, 57' 34.650000", 117, 33' 31.900000"

L4_N
33, 57' 30.340000", 117, 33' 18.740000"

L4_S
33, 57' 30.810000", 117, 33' 18.830000"

L4_W
33, 57' 30.600000", 117, 33' 18.910000"

L5_E
33, 57' 27.620000", 117, 33' 1.170000"

L5_SW
33, 57' 27.600000", 117, 33' 3.130000"

L5_W
33, 57' 27.670000", 117, 33' 1.020000"

L6_E
33, 57' 26.370000", 117, 33' 36.570000"

L6_N
33, 57' 26.370000", 117, 33' 36.570000"

L6_S
33, 57' 26.370000", 117, 33' 36.570000"

L6_W
33, 57' 26.370000", 117, 33' 36.570000"

L7_E
33, 57' 24.830000", 117, 33' 29.370000"

L7_N
33, 57' 24.830000", 117, 33' 29.370000"

L7_S
33, 57' 24.750000", 117, 33' 29.340000"

L7_W
33, 57' 24.830000", 117, 33' 29.370000"

L8_E
33, 57' 18.780000", 117, 33' 29.450000"

L8_N
33, 57' 18.790000", 117, 33' 29.340000"

L8_S
33, 57' 18.780000", 117, 33' 29.430000"

L8_W
33, 57' 18.790000", 117, 33' 29.340000"

L9_E
33, 56' 41.210000", 117, 33' 24.570000"

L9_N
33, 56' 41.210000", 117, 33' 24.570000"

L9_NE
33, 56' 41.210000", 117, 33' 24.570000"

L9_SE
33, 56' 41.210000", 117, 33' 24.570000"

APPENDIX 5.2:

LONG-TERM NOISE LEVEL MEASUREMENT WORKSHEETS

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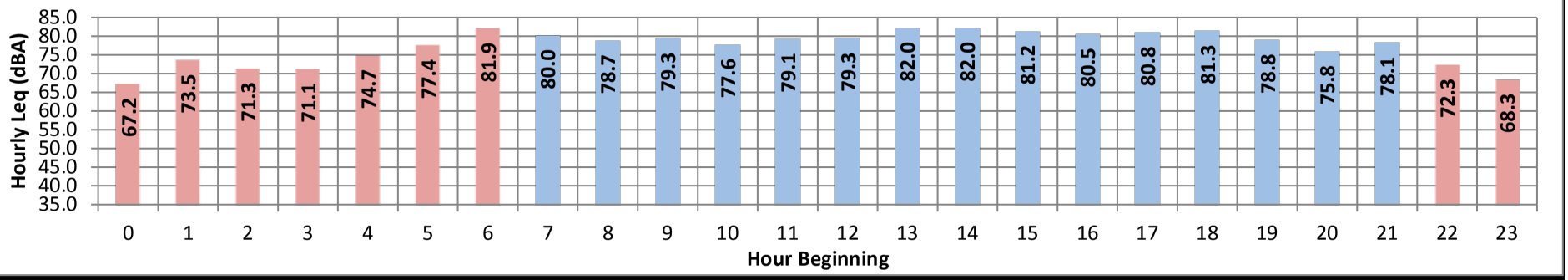
24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Polopolus	*JN:*	11336	*Day*	*Night*	*CNEL*
Location:	L1 - Located north of the Project site on the northeast corner of Hamner Avenue and Riverboat Drive adjacent to existing residential homes.	*Analyst:*	A. Wolfe	79.9	75.5	83.2
		Date:	1/18/2018			

Hourly Leq dBA Readings (unadjusted)



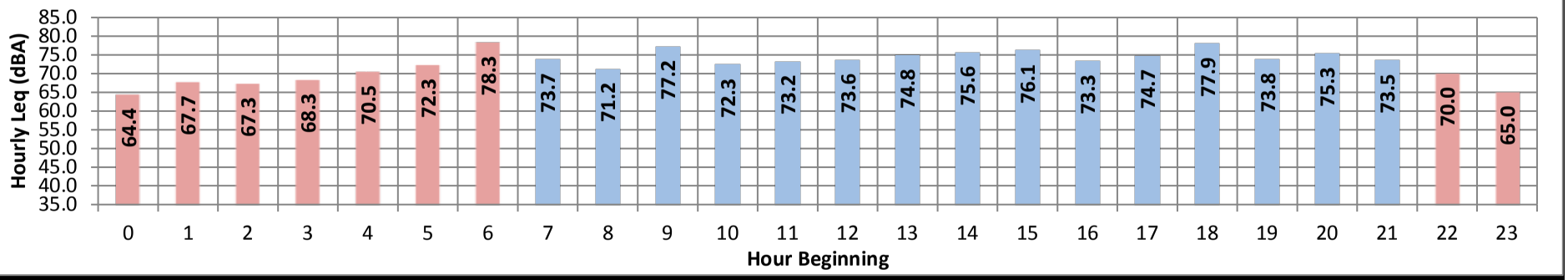
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	75.8	98.0	59.2	86.0	84.0	80.0	78.0	74.0	71.0	65.0	64.0	62.0
	Max	82.0	106.5	64.7	93.0	90.0	86.0	84.0	80.0	77.0	71.0	70.0	68.0
Energy Average:		79.9	Average:		89.9	87.7	83.9	81.9	77.5	74.1	68.7	67.7	65.6
Night	Min	67.2	85.9	54.8	77.0	75.0	72.0	71.0	66.0	62.0	58.0	58.0	57.0
	Max	81.9	104.0	66.3	92.0	90.0	86.0	84.0	80.0	77.0	72.0	71.0	69.0
Energy Average:		75.5	Average:		82.9	80.7	77.4	75.6	70.3	66.7	63.1	62.3	61.2
Hourly Summary													
Night	0	67.2	85.9	54.8	77.0	75.0	72.0	71.0	66.0	62.0	58.0	58.0	57.0
	1	73.5	100.2	56.3	84.0	81.0	76.0	74.0	68.0	62.0	59.0	59.0	58.0
	2	71.3	97.2	56.7	81.0	80.0	78.0	75.0	67.0	64.0	61.0	60.0	59.0
	3	71.1	96.4	59.2	80.0	78.0	76.0	74.0	68.0	65.0	63.0	62.0	61.0
	4	74.7	99.9	59.9	85.0	82.0	78.0	76.0	72.0	69.0	64.0	63.0	62.0
	5	77.4	101.6	63.7	86.0	84.0	82.0	80.0	76.0	72.0	68.0	67.0	66.0
	6	81.9	104.0	66.3	92.0	90.0	86.0	84.0	80.0	77.0	72.0	71.0	69.0
Day	7	80.0	100.4	64.7	90.0	88.0	85.0	83.0	78.0	75.0	70.0	69.0	68.0
	8	78.7	104.0	63.4	89.0	87.0	83.0	81.0	76.0	73.0	68.0	67.0	65.0
	9	79.3	100.9	60.2	90.0	88.0	84.0	82.0	77.0	74.0	68.0	67.0	65.0
	10	77.6	101.3	59.8	87.0	85.0	82.0	80.0	76.0	72.0	67.0	65.0	63.0
	11	79.1	101.5	59.2	90.0	88.0	84.0	82.0	77.0	74.0	67.0	66.0	63.0
	12	79.3	102.9	61.0	89.0	87.0	84.0	82.0	78.0	74.0	69.0	68.0	65.0
	13	82.0	105.1	63.6	92.0	90.0	86.0	84.0	80.0	77.0	71.0	70.0	67.0
	14	82.0	104.7	63.9	93.0	90.0	86.0	84.0	80.0	76.0	71.0	70.0	68.0
	15	81.2	106.5	63.4	92.0	89.0	85.0	83.0	79.0	76.0	71.0	70.0	68.0
	16	80.5	103.0	63.1	90.0	88.0	85.0	83.0	79.0	76.0	71.0	70.0	68.0
	17	80.8	106.0	64.4	90.0	88.0	84.0	82.0	79.0	76.0	71.0	70.0	68.0
	18	81.3	104.4	63.6	92.0	90.0	86.0	84.0	78.0	74.0	69.0	68.0	66.0
	19	78.8	99.7	61.8	90.0	87.0	83.0	81.0	77.0	73.0	67.0	66.0	65.0
	20	75.8	98.0	59.9	86.0	84.0	80.0	78.0	74.0	71.0	66.0	65.0	63.0
	21	78.1	104.0	59.3	89.0	86.0	82.0	80.0	74.0	71.0	65.0	64.0	62.0
Night	22	72.3	94.8	58.2	83.0	80.0	76.0	75.0	70.0	66.0	62.0	61.0	60.0
	23	68.3	89.6	56.8	78.0	76.0	73.0	71.0	66.0	63.0	61.0	60.0	59.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Polopolus	*JN:*	11336	*Energy Average Leq*	*24-Hour*
Location:	L2 - Located at the northwest Project site boundary adjacent to existing residential homes on College Park Drive.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	1/18/2018	74.8 / 71.6	79.0

Hourly Leq dBA Readings (unadjusted)



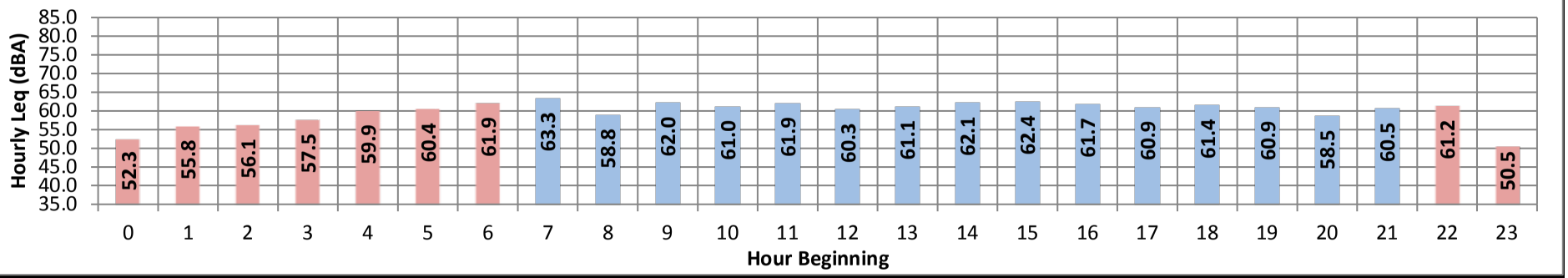
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	71.2	87.0	57.6	80.0	78.0	75.0	73.0	68.0	65.0	62.0	61.0	60.0
	Max	77.9	103.7	65.5	89.0	86.0	82.0	80.0	74.0	71.0	68.0	67.0	66.0
Energy Average:		74.8	Average:		84.5	81.4	78.0	76.5	71.5	68.1	64.2	63.3	62.0
Night	Min	64.4	79.7	56.4	74.0	72.0	69.0	67.0	63.0	61.0	58.0	58.0	57.0
	Max	78.3	102.1	67.4	86.0	84.0	81.0	80.0	76.0	73.0	69.0	69.0	68.0
Energy Average:		71.6	Average:		78.6	76.1	73.0	71.3	67.7	65.3	62.9	62.6	61.9
					Hourly Summary								
Night	0	64.4	79.7	56.4	74.0	72.0	69.0	67.0	63.0	61.0	58.0	58.0	57.0
	1	67.7	90.2	57.9	79.0	76.0	71.0	68.0	64.0	63.0	60.0	60.0	59.0
	2	67.3	81.4	60.2	76.0	74.0	72.0	70.0	67.0	64.0	62.0	62.0	61.0
	3	68.3	85.1	62.8	76.0	74.0	71.0	70.0	68.0	66.0	64.0	64.0	63.0
	4	70.5	90.4	62.6	80.0	77.0	74.0	73.0	69.0	67.0	64.0	64.0	63.0
	5	72.3	87.3	66.0	81.0	79.0	76.0	75.0	72.0	70.0	68.0	67.0	67.0
	6	78.3	102.1	67.4	86.0	84.0	81.0	80.0	76.0	73.0	69.0	69.0	68.0
Day	7	73.7	91.7	65.5	83.0	81.0	77.0	76.0	73.0	71.0	68.0	67.0	66.0
	8	71.2	87.0	63.1	80.0	78.0	76.0	75.0	70.0	68.0	65.0	65.0	64.0
	9	77.2	99.7	61.2	88.0	85.0	82.0	80.0	73.0	69.0	64.0	63.0	62.0
	10	72.3	91.8	57.6	83.0	80.0	77.0	75.0	71.0	67.0	63.0	62.0	60.0
	11	73.2	93.6	57.9	85.0	81.0	78.0	76.0	70.0	67.0	62.0	61.0	60.0
	12	73.6	95.5	58.8	85.0	81.0	78.0	76.0	71.0	67.0	63.0	62.0	61.0
	13	74.8	93.1	60.2	84.0	81.0	79.0	78.0	74.0	71.0	66.0	64.0	62.0
	14	75.6	97.4	60.3	86.0	83.0	79.0	78.0	73.0	70.0	65.0	64.0	62.0
	15	76.1	96.9	60.3	88.0	84.0	79.0	78.0	73.0	69.0	65.0	64.0	62.0
	16	73.3	95.2	61.0	82.0	80.0	77.0	76.0	72.0	68.0	64.0	63.0	62.0
	17	74.7	97.9	61.4	85.0	82.0	78.0	77.0	72.0	69.0	65.0	64.0	63.0
	18	77.9	103.0	61.3	89.0	86.0	82.0	80.0	73.0	68.0	64.0	64.0	62.0
	19	73.8	99.0	62.4	83.0	80.0	77.0	75.0	71.0	68.0	65.0	64.0	63.0
	20	75.3	103.7	59.9	80.0	78.0	75.0	73.0	68.0	65.0	62.0	62.0	61.0
	21	73.5	96.5	57.7	86.0	81.0	76.0	74.0	69.0	65.0	62.0	61.0	60.0
Night	22	70.0	96.5	59.0	81.0	77.0	74.0	72.0	67.0	63.0	61.0	60.0	60.0
	23	65.0	86.3	58.6	74.0	72.0	69.0	67.0	63.0	61.0	60.0	59.0	59.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

			Energy Average Leq		24-Hour
Project Name:	Polopolus	*JN:* 11336	*Day*	*Night*	*CNEL*
Location:	L3 - Located south of Site 2 adjacent to an existing fire station on Hamner Avenue, near existing residential homes.	*Analyst:* A. Wolfe	61.3	58.6	65.9
		Date: 1/18/2018			

Hourly Leq dBA Readings (unadjusted)



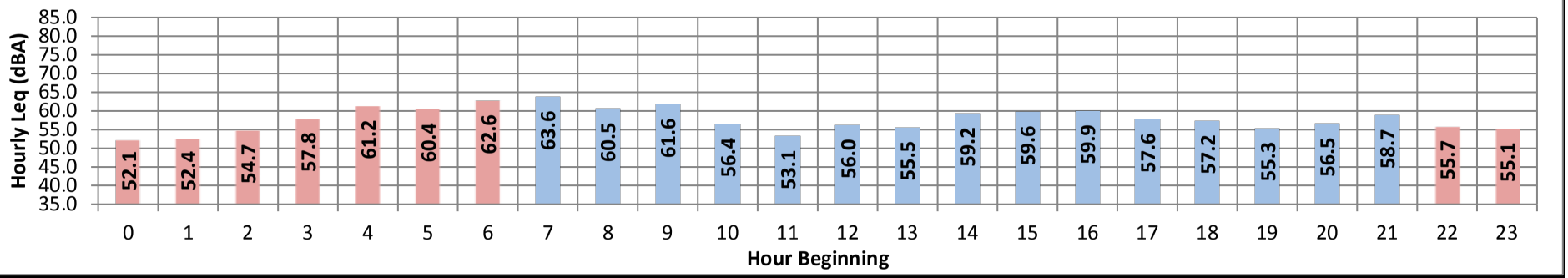
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	58.5	74.9	41.2	67.0	65.0	62.0	61.0	57.0	53.0	47.0	46.0	44.0
	Max	63.3	87.8	50.4	73.0	70.0	66.0	65.0	62.0	61.0	57.0	55.0	52.0
Energy Average:		61.3	Average:		70.1	67.6	64.7	63.2	59.9	57.1	51.2	49.7	47.1
Night	Min	50.5	68.6	41.8	60.0	59.0	56.0	55.0	49.0	45.0	43.0	42.0	42.0
	Max	61.9	92.3	52.6	70.0	69.0	66.0	65.0	61.0	59.0	56.0	55.0	54.0
Energy Average:		58.6	Average:		65.9	64.0	60.8	59.3	55.1	52.1	48.6	47.9	47.0
Hourly Summary													
Night	0	52.3	68.8	42.1	63.0	60.0	57.0	55.0	51.0	48.0	43.0	43.0	42.0
	1	55.8	80.9	42.7	64.0	61.0	57.0	55.0	51.0	49.0	45.0	45.0	44.0
	2	56.1	73.4	45.2	65.0	64.0	61.0	60.0	56.0	52.0	48.0	47.0	46.0
	3	57.5	74.9	50.0	67.0	65.0	61.0	60.0	57.0	55.0	52.0	51.0	50.0
	4	59.9	82.9	48.6	69.0	67.0	64.0	62.0	58.0	56.0	52.0	51.0	49.0
	5	60.4	77.0	52.1	68.0	67.0	65.0	64.0	60.0	57.0	54.0	54.0	53.0
	6	61.9	78.4	52.6	70.0	69.0	66.0	65.0	61.0	59.0	56.0	55.0	54.0
Day	7	63.3	87.0	50.4	73.0	70.0	66.0	64.0	61.0	59.0	54.0	53.0	52.0
	8	58.8	74.9	46.4	67.0	65.0	63.0	62.0	59.0	56.0	50.0	49.0	47.0
	9	62.0	87.1	44.1	71.0	69.0	66.0	64.0	60.0	57.0	51.0	50.0	47.0
	10	61.0	83.5	41.2	70.0	67.0	65.0	63.0	60.0	57.0	49.0	47.0	44.0
	11	61.9	84.9	41.7	72.0	69.0	65.0	63.0	59.0	56.0	49.0	46.0	44.0
	12	60.3	80.0	41.4	71.0	68.0	64.0	63.0	59.0	56.0	49.0	47.0	45.0
	13	61.1	76.7	42.9	71.0	69.0	66.0	64.0	60.0	57.0	51.0	50.0	47.0
	14	62.1	76.3	46.5	69.0	67.0	65.0	64.0	62.0	61.0	57.0	55.0	52.0
	15	62.4	78.9	43.1	70.0	68.0	66.0	65.0	62.0	60.0	54.0	52.0	47.0
	16	61.7	76.5	46.7	70.0	68.0	66.0	65.0	62.0	59.0	53.0	51.0	48.0
	17	60.9	78.8	44.9	70.0	68.0	65.0	63.0	60.0	58.0	52.0	50.0	47.0
	18	61.4	82.9	43.7	71.0	68.0	64.0	63.0	60.0	57.0	50.0	49.0	46.0
	19	60.9	85.1	48.8	69.0	67.0	65.0	63.0	60.0	57.0	53.0	52.0	50.0
	20	58.5	78.5	44.9	68.0	65.0	62.0	61.0	57.0	54.0	49.0	48.0	46.0
	21	60.5	87.8	43.0	70.0	66.0	62.0	61.0	57.0	53.0	47.0	46.0	44.0
Night	22	61.2	92.3	42.7	67.0	64.0	60.0	58.0	53.0	48.0	44.0	43.0	43.0
	23	50.5	68.6	41.8	60.0	59.0	56.0	55.0	49.0	45.0	43.0	42.0	42.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Polopolus	*JN:*	11336	*Energy Average Leq*	*24-Hour*
Location:	L4 - Located north of the Project site on Mississippi Drive in an existing residential community.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	1/24/2018	58.9 / 58.4	65.0

Hourly Leq dBA Readings (unadjusted)



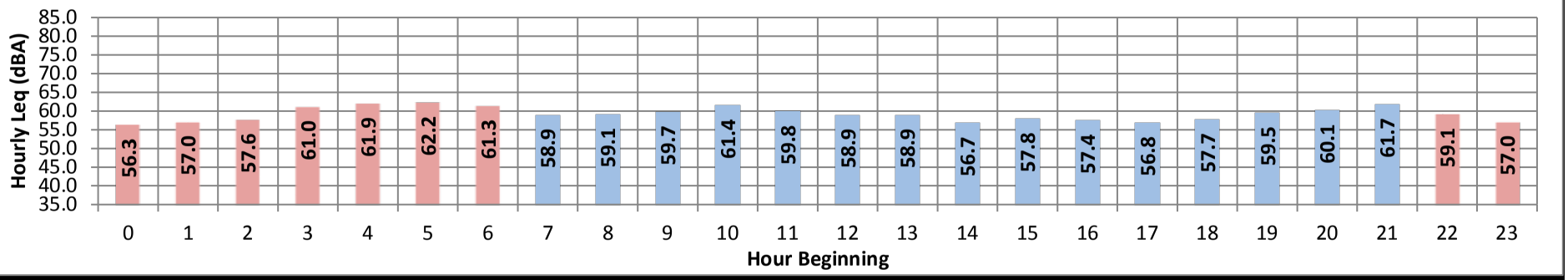
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	53.1	73.4	38.0	66.0	64.0	57.0	55.0	47.0	42.0	39.0	38.0	38.0
	Max	63.6	90.8	49.5	74.0	72.0	70.0	70.0	58.0	55.0	52.0	51.0	50.0
Energy Average:		58.9	Average:		69.5	67.5	63.2	60.5	52.1	47.6	44.0	43.6	42.9
Night	Min	52.1	65.3	42.7	60.0	58.0	54.0	53.0	51.0	49.0	46.0	45.0	43.0
	Max	62.6	90.1	54.3	71.0	68.0	62.0	61.0	59.0	58.0	56.0	56.0	55.0
Energy Average:		58.4	Average:		65.3	62.7	59.0	57.7	55.2	53.6	50.5	49.8	48.4
Hourly Summary													
Night	0	52.1	72.9	42.7	61.0	58.0	54.0	53.0	51.0	49.0	46.0	45.0	43.0
	1	52.4	76.6	42.8	60.0	59.0	56.0	55.0	51.0	49.0	46.0	45.0	44.0
	2	54.7	65.3	44.4	60.0	59.0	58.0	57.0	55.0	53.0	50.0	49.0	47.0
	3	57.8	83.9	47.5	65.0	62.0	60.0	59.0	57.0	55.0	50.0	49.0	48.0
	4	61.2	85.6	52.2	71.0	67.0	61.0	60.0	58.0	57.0	55.0	55.0	54.0
	5	60.4	80.2	54.3	70.0	67.0	62.0	61.0	59.0	58.0	56.0	56.0	55.0
	6	62.6	90.1	52.7	71.0	68.0	62.0	60.0	58.0	57.0	55.0	54.0	53.0
Day	7	63.6	90.8	49.0	74.0	72.0	68.0	65.0	58.0	55.0	51.0	50.0	50.0
	8	60.5	80.2	46.7	72.0	70.0	67.0	63.0	57.0	53.0	48.0	48.0	47.0
	9	61.6	78.2	42.1	71.0	71.0	70.0	70.0	55.0	48.0	43.0	43.0	42.0
	10	56.4	78.0	41.1	68.0	66.0	62.0	59.0	52.0	47.0	42.0	42.0	42.0
	11	53.1	73.7	40.1	66.0	64.0	57.0	55.0	47.0	44.0	42.0	42.0	41.0
	12	56.0	84.3	38.1	67.0	65.0	59.0	56.0	47.0	43.0	40.0	39.0	39.0
	13	55.5	79.7	38.0	68.0	66.0	62.0	58.0	47.0	42.0	39.0	38.0	38.0
	14	59.2	86.7	38.1	70.0	68.0	64.0	62.0	52.0	44.0	39.0	38.0	38.0
	15	59.6	85.8	38.0	71.0	69.0	65.0	62.0	51.0	45.0	39.0	39.0	38.0
	16	59.9	85.9	39.9	71.0	69.0	65.0	62.0	52.0	46.0	42.0	42.0	41.0
	17	57.6	75.4	42.7	70.0	67.0	64.0	61.0	53.0	47.0	44.0	44.0	43.0
	18	57.2	79.6	42.6	69.0	67.0	63.0	60.0	52.0	47.0	44.0	44.0	43.0
	19	55.3	77.4	42.8	67.0	65.0	61.0	58.0	49.0	46.0	44.0	44.0	43.0
	20	56.5	73.4	48.3	68.0	65.0	60.0	57.0	54.0	53.0	51.0	50.0	49.0
	21	58.7	78.2	49.5	70.0	68.0	61.0	59.0	56.0	54.0	52.0	51.0	50.0
Night	22	55.7	76.7	45.4	66.0	63.0	59.0	57.0	54.0	52.0	47.0	46.0	45.0
	23	55.1	73.0	46.4	64.0	61.0	59.0	57.0	54.0	52.0	49.9	49.0	47.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Polopolus	*JN:*	11336	*Day*	*Night*	*CNEL*
Location:	L5 - Located on Kern River Road east of the Project site within an existing residential community.	*Analyst:*	A. Wolfe	59.2	59.8	66.5
		Date:	1/24/2018			

Hourly Leq dBA Readings (unadjusted)



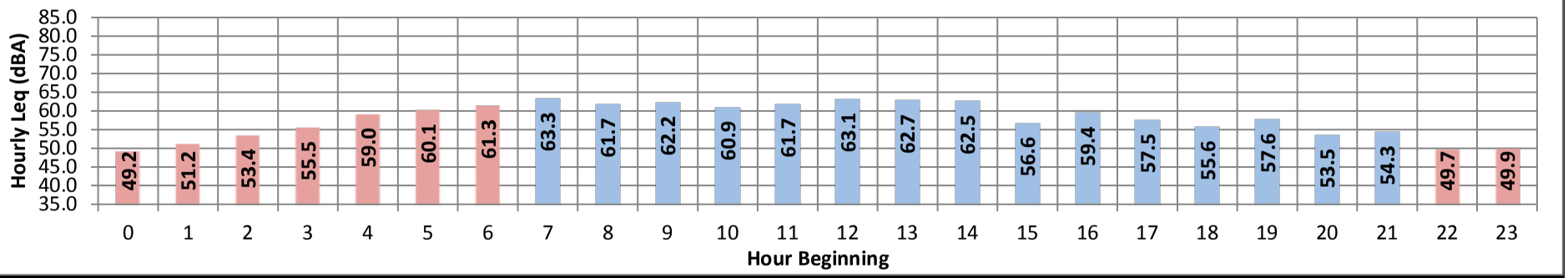
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	56.7	66.8	50.3	62.0	60.0	59.0	58.0	56.0	55.0	53.0	52.0	51.0
	Max	61.7	91.7	54.3	70.0	67.0	63.0	62.0	60.0	59.0	57.0	57.0	56.0
Energy Average:		59.2	Average:		64.9	62.9	60.9	60.1	58.4	57.5	55.3	54.8	53.7
Night	Min	56.3	69.0	46.8	62.0	60.0	59.0	58.0	57.0	55.0	52.0	51.0	49.0
	Max	62.2	80.1	56.6	70.0	68.0	65.0	63.0	62.0	61.0	59.0	58.0	58.0
Energy Average:		59.8	Average:		65.4	63.7	61.9	60.8	59.3	57.8	55.2	54.4	53.1
Hourly Summary													
Night	0	56.3	69.0	47.9	62.0	60.0	59.0	58.0	57.0	55.0	52.0	51.0	49.0
	1	57.0	71.1	46.8	64.0	61.0	60.0	59.0	57.0	55.0	52.0	51.0	49.0
	2	57.6	72.0	49.8	64.0	61.0	60.0	59.0	58.0	56.0	54.0	53.0	52.0
	3	61.0	77.0	53.2	65.0	64.0	63.0	62.0	61.0	60.0	57.0	56.0	54.0
	4	61.9	80.1	56.5	67.0	65.0	64.0	63.0	62.0	61.0	59.0	58.0	58.0
	5	62.2	73.6	56.6	70.0	68.0	65.0	63.0	62.0	61.0	59.0	58.0	57.0
	6	61.3	72.2	55.3	67.0	66.0	63.0	62.0	61.0	60.0	58.0	58.0	57.0
Day	7	58.9	71.9	53.8	67.0	64.0	61.0	60.0	59.0	58.0	56.0	55.0	54.0
	8	59.1	70.3	53.5	64.0	62.0	61.0	60.0	59.0	58.0	56.0	56.0	54.0
	9	59.7	76.1	53.4	68.0	65.0	62.0	60.0	59.0	58.0	56.0	56.0	55.0
	10	61.4	81.5	53.0	70.0	67.0	63.0	62.0	60.0	59.0	57.0	56.0	55.0
	11	59.8	71.4	54.3	64.0	62.0	61.0	61.0	60.0	59.0	57.0	56.0	55.0
	12	58.9	70.1	52.2	63.0	62.0	61.0	61.0	59.0	58.0	56.0	55.0	54.0
	13	58.9	75.2	53.0	65.0	63.0	61.0	60.0	58.0	58.0	56.0	55.0	54.0
	14	56.7	74.8	50.4	64.0	61.0	59.0	58.0	56.0	55.0	53.0	52.0	51.0
	15	57.8	77.5	50.3	66.0	64.0	60.0	59.0	56.0	55.0	53.0	52.0	51.0
	16	57.4	73.7	52.4	63.0	62.0	60.0	59.0	57.0	56.0	54.0	54.0	53.0
	17	56.8	74.1	52.4	62.0	60.0	59.0	58.0	56.0	56.0	54.0	54.0	53.0
	18	57.7	66.8	51.6	63.0	62.0	60.0	59.0	58.0	57.0	54.0	54.0	53.0
	19	59.5	69.9	52.9	64.0	63.0	62.0	62.0	60.0	58.0	56.0	55.0	54.0
	20	60.1	70.1	54.3	64.0	63.0	62.0	62.0	60.0	59.0	57.0	57.0	56.0
	21	61.7	91.7	52.2	66.0	64.0	62.0	61.0	59.0	58.0	55.0	55.0	54.0
Night	22	59.1	73.5	50.9	66.0	65.0	62.0	61.0	59.0	57.0	54.0	54.0	53.0
	23	57.0	69.2	46.8	64.0	63.0	61.0	60.0	57.0	55.0	52.0	51.0	49.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq	
Project Name: Polopolus	*JN:* 11336	*Day*	*Night*	*24-Hour CNEL*
Location: L6 - Located west of the Project site in an existing church parking lot near existing residential homes north of Schleisman Road.	*Analyst:* A. Wolfe	60.5	56.6	64.0
	Date: 1/24/2018			

Hourly Leq dBA Readings (unadjusted)



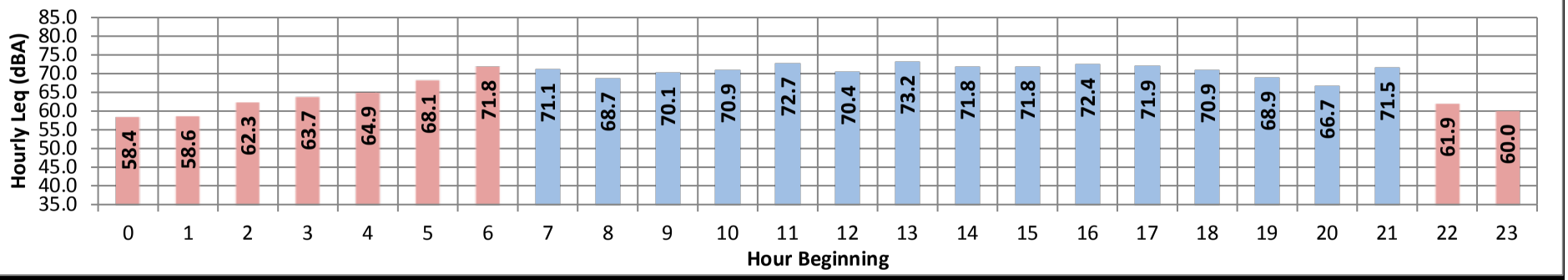
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	53.5	71.0	39.5	62.0	60.0	57.0	56.0	51.0	48.0	45.0	44.0	41.0
	Max	63.3	85.3	51.2	74.0	72.0	68.0	67.0	63.0	60.0	55.0	54.0	53.0
Energy Average:		60.5	Average:		69.0	66.3	63.1	61.7	57.6	54.1	49.1	47.7	45.9
Night	Min	49.2	64.8	41.0	58.0	56.0	52.0	50.0	45.0	44.0	42.0	42.0	41.0
	Max	61.3	77.6	52.5	71.0	69.0	66.0	64.0	60.0	58.0	55.0	54.0	53.0
Energy Average:		56.6	Average:		63.4	61.0	57.8	56.3	52.8	50.7	47.9	47.3	46.4
Hourly Summary													
Night	0	49.2	64.8	41.1	58.0	56.0	53.0	52.0	49.0	46.0	43.0	42.0	42.0
	1	51.2	74.2	42.2	61.0	58.0	53.0	52.0	49.0	48.0	45.0	44.0	43.0
	2	53.4	70.7	45.7	63.0	61.0	57.0	56.0	53.0	50.0	48.0	47.0	46.0
	3	55.5	74.0	48.8	61.0	59.0	57.0	57.0	55.0	54.0	51.0	51.0	50.0
	4	59.0	76.2	49.1	69.0	66.0	63.0	61.0	58.0	55.0	51.0	51.0	50.0
	5	60.1	76.8	51.4	69.0	67.0	65.0	63.0	59.0	56.0	54.0	53.0	52.0
	6	61.3	77.6	52.5	71.0	69.0	66.0	64.0	60.0	58.0	55.0	54.0	53.0
Day	7	63.3	82.1	51.2	74.0	72.0	68.0	65.0	61.0	58.0	55.0	54.0	53.0
	8	61.7	82.5	48.7	72.0	69.0	67.0	65.0	59.0	56.0	52.0	51.0	50.0
	9	62.2	81.9	45.3	70.0	67.0	65.0	65.0	62.0	57.0	51.0	49.0	46.0
	10	60.9	84.3	39.5	71.0	68.0	64.0	62.0	57.0	52.0	46.0	44.0	41.0
	11	61.7	78.4	45.7	72.0	70.0	67.0	65.0	60.0	58.0	52.0	50.0	48.0
	12	63.1	82.4	44.6	72.0	70.0	68.0	67.0	62.0	59.0	53.0	51.0	49.0
	13	62.7	78.7	43.2	70.0	69.0	67.0	66.0	63.0	60.0	50.0	48.0	45.0
	14	62.5	80.9	42.0	70.0	69.0	67.0	67.0	63.0	56.0	48.0	46.0	43.0
	15	56.6	75.6	41.0	68.0	65.0	61.0	59.0	55.0	51.0	46.0	45.0	43.0
	16	59.4	85.3	43.8	68.0	65.0	61.0	60.0	55.0	52.0	47.0	46.0	44.0
	17	57.5	80.8	43.3	68.0	64.0	60.0	58.0	54.0	51.0	46.0	45.0	44.0
	18	55.6	78.8	44.3	66.0	62.0	58.0	57.0	54.0	51.0	47.0	46.0	45.0
	19	57.6	84.1	47.9	66.0	62.0	59.0	58.0	55.0	53.0	51.0	50.0	49.0
	20	53.5	71.0	44.1	62.0	60.0	57.0	56.0	53.0	50.0	47.0	46.0	45.0
	21	54.3	73.2	43.2	66.0	63.0	58.0	56.0	51.0	48.0	45.0	44.0	43.0
Night	22	49.7	67.3	41.1	61.0	57.0	54.0	52.0	47.0	45.0	42.0	42.0	41.0
	23	49.9	73.3	41.0	58.0	56.0	52.0	50.0	45.0	44.0	42.0	42.0	41.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

					Energy Average Leq		24-Hour
Project Name:	Polopolus	*JN:*	11336		*Day*	*Night*	*CNEL*
Location:	L7 - Located on Hamner Avenue adjacent to the western Project site boundary near existing residential homes.	*Analyst:*	A. Wolfe		71.1	65.6	73.8
		Date:	1/18/2018				

Hourly Leq dBA Readings (unadjusted)



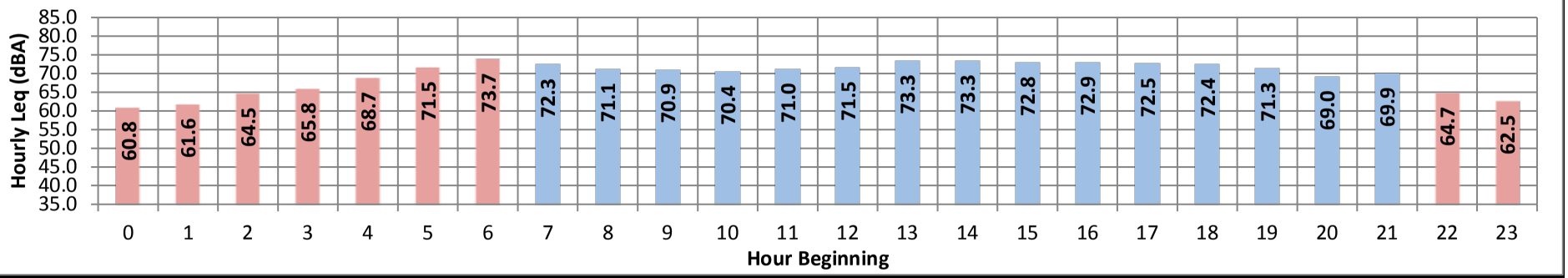
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	66.7	84.4	47.3	76.0	73.0	71.0	70.0	65.0	60.0	53.0	51.0	48.0
	Max	73.2	101.1	55.8	83.0	80.0	77.0	75.0	72.0	68.0	60.0	59.0	57.0
Energy Average:		71.1	Average:		80.2	77.4	74.3	72.9	69.1	65.0	57.8	56.5	54.0
Night	Min	58.4	76.5	42.9	69.0	67.0	64.0	61.0	55.0	50.0	46.0	45.0	44.0
	Max	71.8	93.1	56.4	81.0	79.0	76.0	75.0	71.0	68.0	62.0	60.0	58.0
Energy Average:		65.6	Average:		73.2	71.2	68.2	66.4	61.1	57.3	52.7	51.2	49.8
Hourly Summary													
Night	0	58.4	76.5	43.7	69.0	67.0	64.0	62.0	56.0	53.0	48.0	47.0	45.0
	1	58.6	78.0	45.6	70.0	68.0	64.0	61.0	56.0	53.0	49.0	48.0	47.0
	2	62.3	86.0	48.5	72.0	69.0	66.0	64.0	60.0	56.0	52.0	50.0	49.0
	3	63.7	89.7	51.2	73.0	71.0	68.0	66.0	60.0	57.0	54.0	53.0	52.0
	4	64.9	82.4	51.2	74.0	72.0	70.0	69.0	64.0	61.0	56.0	54.0	52.0
	5	68.1	83.5	56.2	77.0	76.0	73.0	72.0	68.0	64.0	60.0	59.0	57.0
	6	71.8	93.1	56.4	81.0	79.0	76.0	75.0	71.0	68.0	62.0	60.0	58.0
Day	7	71.1	91.3	55.8	81.0	79.0	75.0	74.0	70.0	66.0	60.0	59.0	57.0
	8	68.7	84.4	52.2	79.0	76.0	74.0	72.0	68.0	64.0	57.0	56.0	54.0
	9	70.1	93.6	50.7	80.0	77.0	74.0	73.0	68.0	64.0	57.0	56.0	53.0
	10	70.9	95.4	50.1	79.0	76.0	73.0	72.0	68.0	64.0	56.0	55.0	52.0
	11	72.7	101.1	50.2	81.0	78.0	75.0	73.0	69.0	65.0	57.0	55.0	53.0
	12	70.4	91.8	52.9	80.0	78.0	75.0	73.0	70.0	65.0	58.0	57.0	54.0
	13	73.2	100.2	49.8	82.0	78.0	75.0	74.0	70.0	66.0	59.0	58.0	56.0
	14	71.8	91.2	53.0	82.0	79.0	76.0	74.0	71.0	68.0	60.0	59.0	56.0
	15	71.8	91.3	51.4	81.0	79.0	76.0	75.0	71.0	68.0	60.0	58.0	55.0
	16	72.4	91.8	53.1	83.0	80.0	77.0	75.0	72.0	68.0	60.0	59.0	56.0
	17	71.9	96.0	54.2	82.0	79.0	76.0	74.0	71.0	67.0	59.0	58.0	56.0
	18	70.9	96.4	54.0	80.0	77.0	73.0	72.0	69.0	65.0	58.0	57.0	55.0
	19	68.9	87.4	50.3	79.0	77.0	73.0	72.0	68.0	64.0	58.0	56.0	54.0
	20	66.7	88.7	49.7	76.0	73.0	71.0	70.0	66.0	61.0	55.0	54.0	51.0
	21	71.5	100.9	47.3	78.0	75.0	72.0	70.0	65.0	60.0	53.0	51.0	48.0
Night	22	61.9	83.4	42.9	72.0	70.0	68.0	66.0	60.0	54.0	47.0	45.0	44.0
	23	60.0	81.0	43.2	71.0	69.0	65.0	63.0	55.0	50.0	46.0	45.0	44.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

				Energy Average Leq		24-Hour
Project Name:	Polopolus	*JN:*	11336	*Day*	*Night*	*CNEL*
Location:	L8 - Located at the western Project site boundary on Hamner Avenue near existing residential homes.	*Analyst:*	A. Wolfe	71.8	68.2	75.7
		Date:	1/18/2018			

Hourly Leq dBA Readings (unadjusted)



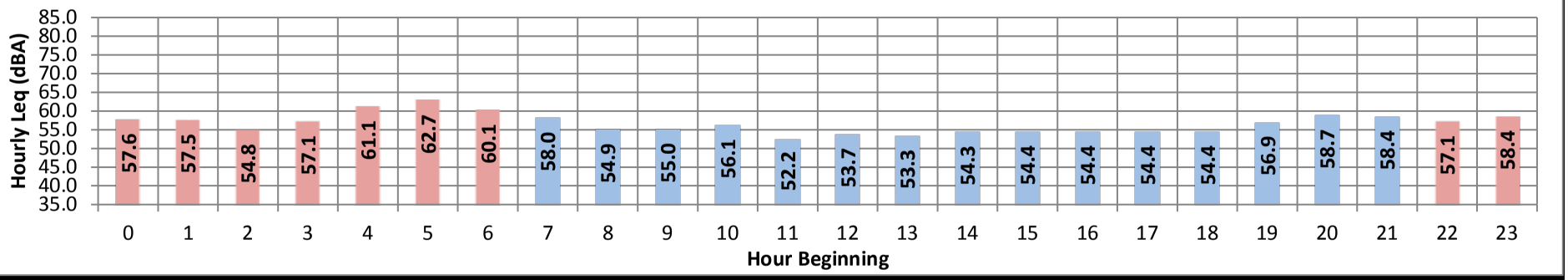
Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	69.0	88.1	46.5	77.0	75.0	74.0	72.0	68.0	63.0	54.0	53.0	49.0
	Max	73.3	99.5	55.2	81.0	79.0	77.0	76.0	73.0	71.0	60.0	58.0	57.0
Energy Average:		71.8	Average:		79.7	77.7	75.5	74.5	71.7	68.2	58.0	55.8	52.7
Night	Min	60.8	80.2	46.1	72.0	70.0	66.0	64.0	58.0	52.0	49.0	48.0	47.0
	Max	73.7	91.5	57.8	81.0	79.0	77.0	76.0	74.0	72.0	64.0	61.0	59.0
Energy Average:		68.2	Average:		75.2	73.6	71.1	69.4	64.2	59.9	55.1	54.0	52.6
Hourly Summary													
Night	0	60.8	80.2	46.1	72.0	70.0	67.0	64.0	58.0	54.0	50.0	49.0	48.0
	1	61.6	84.2	49.6	72.0	70.0	66.0	64.0	58.0	55.0	52.0	51.0	50.0
	2	64.5	88.9	51.6	74.0	72.0	69.0	67.0	61.0	58.0	55.0	54.0	53.0
	3	65.8	86.7	55.0	75.0	73.0	71.0	70.0	64.0	60.0	58.0	57.0	56.0
	4	68.7	88.4	54.8	77.0	76.0	74.0	73.0	69.0	64.0	57.0	57.0	55.0
	5	71.5	86.2	57.7	79.0	78.0	76.0	75.0	72.0	68.0	61.0	60.0	59.0
	6	73.7	91.5	57.8	81.0	79.0	77.0	76.0	74.0	72.0	64.0	61.0	58.0
Day	7	72.3	88.5	55.2	80.0	79.0	77.0	76.0	73.0	70.0	60.0	58.0	57.0
	8	71.1	88.8	53.7	80.0	77.0	75.0	74.0	72.0	68.0	58.0	57.0	55.0
	9	70.9	92.3	49.4	79.0	77.0	75.0	74.0	71.0	67.0	56.0	53.0	50.0
	10	70.4	88.1	47.5	78.0	77.0	75.0	74.0	71.0	68.0	56.0	53.0	50.0
	11	71.0	92.7	46.5	80.0	78.0	75.0	74.0	71.0	68.0	57.0	55.0	51.0
	12	71.5	93.1	46.6	80.0	78.0	76.0	75.0	72.0	68.0	57.0	54.0	49.0
	13	73.3	99.5	49.8	81.0	78.0	76.0	75.0	73.0	70.0	59.0	56.0	53.0
	14	73.3	98.8	49.2	80.0	78.0	76.0	75.0	73.0	70.0	59.0	57.0	52.0
	15	72.8	92.6	49.6	81.0	79.0	77.0	76.0	73.0	70.0	59.0	56.0	52.0
	16	72.9	90.6	49.9	80.0	79.0	77.0	76.0	73.0	71.0	60.0	57.0	52.0
	17	72.5	91.5	51.3	80.0	78.0	76.0	75.0	73.0	70.0	60.0	57.0	53.0
	18	72.4	99.1	54.1	79.0	77.0	75.0	74.0	72.0	68.0	59.0	57.0	55.0
	19	71.3	93.0	54.4	80.0	78.0	75.0	74.0	71.0	67.0	59.0	58.0	56.0
	20	69.0	89.0	53.4	77.0	75.0	74.0	73.0	69.0	65.0	57.0	56.0	55.0
	21	69.9	96.3	50.5	80.0	77.0	74.0	72.0	68.0	63.0	54.0	53.0	51.0
Night	22	64.7	83.0	46.7	74.0	73.0	71.0	69.0	64.0	56.0	50.0	49.0	47.0
	23	62.5	84.1	46.1	73.0	71.0	69.0	67.0	58.0	52.0	49.0	48.0	47.0

URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Project Name:	Polopolus	*JN:*	11336	*Energy Average Leq*	*24-Hour*
Location:	L9 - Located south of the Project site on Old Hamner Avenue near existing residential homes.	*Analyst:*	A. Wolfe	*Day* / *Night*	*CNEL*
		Date:	1/24/2018	55.7 / 59.1	65.4

Hourly Leq dBA Readings (unadjusted)



Time Period	*Hour*	*Leq*	*Lmax*	*Lmin*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	52.2	66.6	45.8	60.0	58.0	55.0	53.0	51.0	50.0	48.0	48.0	47.0
	Max	58.7	77.0	52.1	67.0	64.0	62.0	62.0	59.0	57.0	54.0	53.0	53.0
Energy Average:		55.7	Average:		62.8	60.7	58.1	57.1	54.5	53.1	50.7	50.1	49.1
Night	Min	54.8	66.9	47.4	62.0	59.0	58.0	57.0	55.0	53.0	50.0	50.0	48.0
	Max	62.7	80.7	56.8	69.0	68.0	65.0	64.0	62.0	61.0	60.0	59.0	58.0
Energy Average:		59.1	Average:		64.3	63.1	61.4	60.6	58.6	56.7	54.2	53.7	52.4
Hourly Summary													
Night	0	57.6	71.1	50.0	64.0	63.0	61.0	60.0	58.0	56.0	53.0	52.0	51.0
	1	57.5	68.8	47.7	64.0	63.0	62.0	61.0	58.0	55.0	53.0	52.0	50.0
	2	54.8	69.1	47.4	62.0	59.0	58.0	57.0	55.0	53.0	50.0	50.0	48.0
	3	57.1	66.9	49.9	62.0	62.0	61.0	60.0	58.0	55.0	51.0	51.0	50.0
	4	61.1	73.3	55.4	65.0	64.0	63.0	63.0	61.0	60.0	58.0	58.0	57.0
	5	62.7	73.2	56.8	69.0	68.0	65.0	64.0	62.0	61.0	60.0	59.0	58.0
	6	60.1	69.8	55.6	65.0	63.0	62.0	61.0	60.0	59.0	58.0	57.0	57.0
Day	7	58.0	75.9	52.1	67.0	64.0	60.0	59.0	57.0	56.0	54.0	53.0	53.0
	8	54.9	69.4	48.6	62.0	60.0	57.0	56.0	54.0	53.0	51.0	51.0	50.0
	9	55.0	73.0	47.1	63.0	60.0	58.0	57.0	54.0	53.0	51.0	50.0	49.0
	10	56.1	76.1	46.7	67.0	64.0	60.0	58.0	53.0	51.0	49.0	48.0	48.0
	11	52.2	70.5	46.4	60.0	58.0	55.0	53.0	51.0	50.0	48.0	48.0	47.0
	12	53.7	69.6	46.2	64.0	60.0	57.0	55.0	53.0	51.0	48.0	48.0	47.0
	13	53.3	66.6	45.8	62.0	59.0	56.0	55.0	53.0	51.0	49.0	48.0	47.0
	14	54.3	66.7	47.1	60.0	59.0	57.0	57.0	54.0	53.0	51.0	50.0	48.0
	15	54.4	70.5	46.5	62.0	61.0	58.0	57.0	54.0	52.0	50.0	49.0	48.0
	16	54.4	72.5	47.1	61.5	59.5	57.0	56.0	53.5	52.0	50.0	49.5	48.0
	17	54.4	74.4	47.6	61.0	58.0	56.0	55.0	53.0	52.0	50.0	50.0	48.0
	18	54.4	71.6	48.6	60.0	59.0	57.0	56.0	54.0	53.0	51.0	51.0	50.0
	19	56.9	72.5	50.1	64.0	62.0	60.0	59.0	57.0	55.0	53.0	52.0	51.0
	20	58.7	70.4	49.4	65.0	64.0	62.0	62.0	59.0	57.0	53.0	52.0	51.0
	21	58.4	77.0	49.6	64.0	63.0	62.0	61.0	58.0	57.0	53.0	52.0	51.0
Night	22	57.1	67.3	50.8	64.0	63.0	60.0	59.0	57.0	55.0	53.0	52.0	51.0
	23	58.4	80.7	49.1	64.0	63.0	61.0	60.0	58.0	56.0	52.0	52.0	50.0

URBAN CROSSROADS

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APPENDIX 5.3:

SHORT-TERM NOISE LEVEL MEASUREMENT WORKSHEETS

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JN:11336 Site 2 Short-Term Measurement Photos

S1_E
33, 57' 39.160000", 117, 33' 33.470000"

S1_N
33, 57' 39.160000", 117, 33' 33.470000"

S1_NE
33, 57' 39.160000", 117, 33' 33.470000"

S1_W
33, 57' 39.160000", 117, 33' 33.470000"

S2_E
33, 57' 37.720000", 117, 33' 33.190000"

S2_N
33, 57' 37.720000", 117, 33' 33.190000"

JN:11336 Site 2 Short-Term Measurement Photos

S2_NE
33, 57' 37.720000", 117, 33' 33.190000"

S2_NW
33, 57' 37.720000", 117, 33' 33.190000"

S2_S
33, 57' 37.720000", 117, 33' 33.190000"

S2_SW
33, 57' 37.720000", 117, 33' 33.190000"

S2_W
33, 57' 37.720000", 117, 33' 33.190000"

S3_NW
33, 57' 37.340000", 117, 33' 33.050000"

JN:11336 Site 2 Short-Term Measurement Photos

S3_SW
33, 57' 37.480000", 117, 33' 33.130000"

S3_W
33, 57' 37.340000", 117, 33' 33.050000"

S4_S
33, 57' 37.050000", 117, 33' 33.150000"

S4_S2
33, 57' 35.980000", 117, 33' 33.010000"

S4_SW
33, 57' 37.340000", 117, 33' 33.050000"

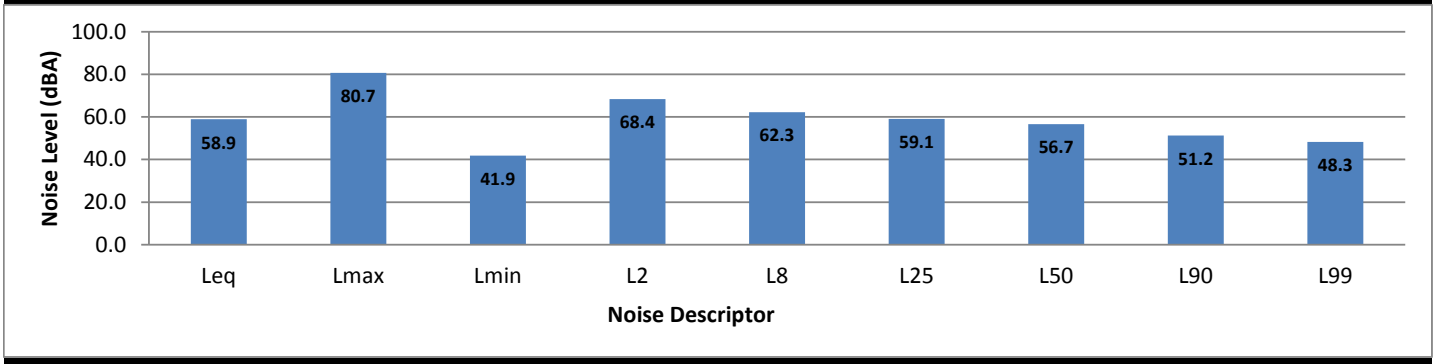
Short-Term Noise Level Measurement Summary

Project Name:	Polopolus (Site 2 Car Wash)	*JN:*	11336
Measurement ID:	S1	*Analyst:*	A. Wolfe
Measurement Location:	12653 & 12679 Thornbury Lane on Riverboat Drive	*Date:*	2/22/2018
Sound Level Meter:	SoftdB Piccolo Type 2		
Response:	Slow		
Noise Source:	Existing traffic volumes on Riverboat Drive and Hamner Avenue. Adjacent parking lot vehicle movements from the 7-Eleven convenience store and background gardening and lawn mower noise from within the residential neighborhood north of the meter.		

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:00:00 AM	11:00:00 AM	1:00:00

S1

Noise Levels (dBA)



Measurement Results (dBA)

L_{eq}	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	L_{90}	L_{99}
58.9	80.7	41.9	68.4	62.3	59.1	56.7	51.2	48.3

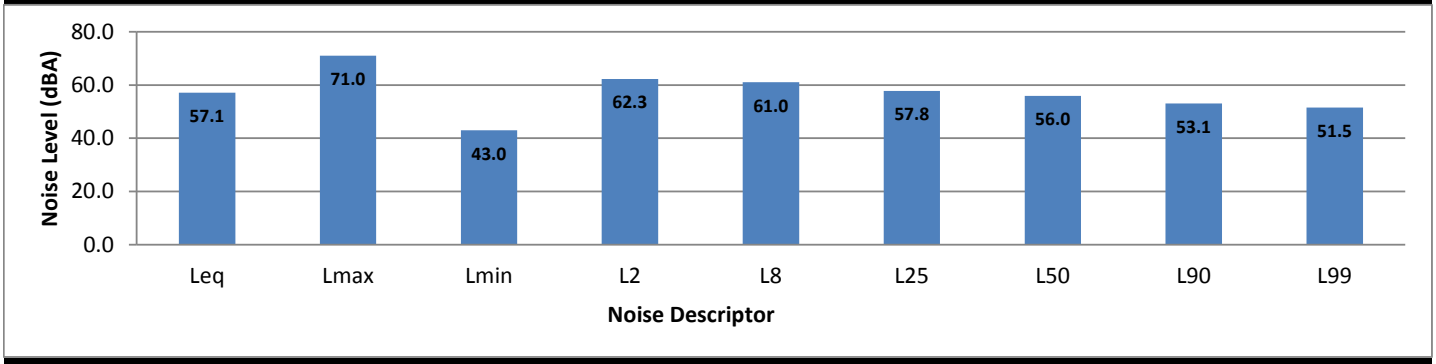
Short-Term Noise Level Measurement Summary

Project Name: Polopolus (Site 2 Car Wash)
JN: 11336
Measurement ID: S2
Analyst: A. Wolfe
Measurement Location: 7012 & 7022 College Park Drive
Date: 2/22/2018
within Site 2
Sound Level Meter: SoftdB Piccolo Type 2
Response: Slow
Noise Source: Existing traffic volumes on Riverboat Drive and Hamner Avenue. Adjacent parking lot vehicle movements from the 7-Eleven convenience store.

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:00:00 AM	11:00:00 AM	1:00:00

S2

Noise Levels (dBA)



Measurement Results (dBA)

L_{eq}	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	L_{90}	L_{99}
57.1	71.0	43.0	62.3	61.0	57.8	56.0	53.1	51.5

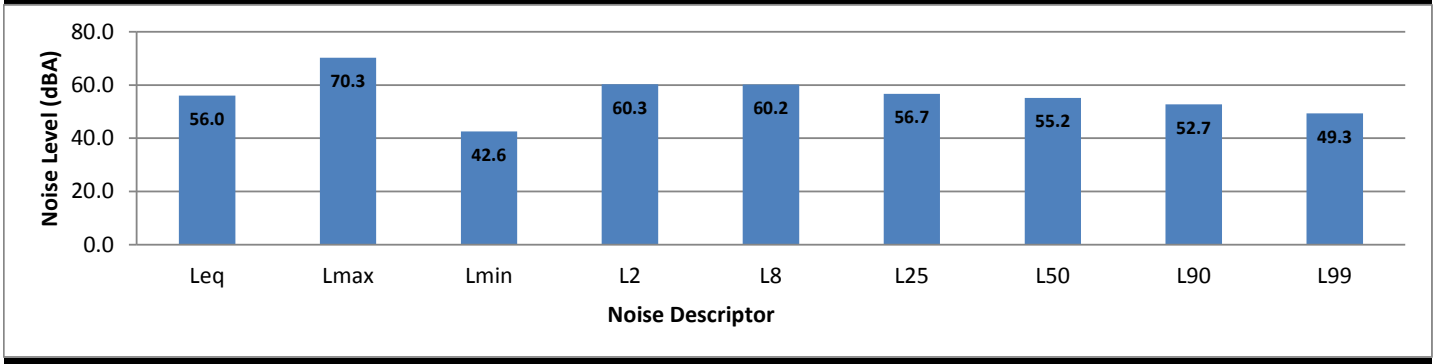
Short-Term Noise Level Measurement Summary

Project Name:	Polopolus (Site 2 Car Wash)	*JN:*	11336
Measurement ID:	S3 - First Floor	*Analyst:*	A. Wolfe
Measurement Location:	7032 College Park Drive within Site 2	*Date:*	2/22/2018
Sound Level Meter:	SoftdB Piccolo Type 2		
Response:	Slow		
Noise Source:	Existing traffic volumes on Riverboat Drive and Hamner Avenue.		

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:00:00 AM	11:00:00 AM	1:00:00

S3 - First Floor

Noise Levels (dBA)



Measurement Results (dBA)

L_{eq}	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	L_{90}	L_{99}
56.0	70.3	42.6	60.3	60.2	56.7	55.2	52.7	49.3

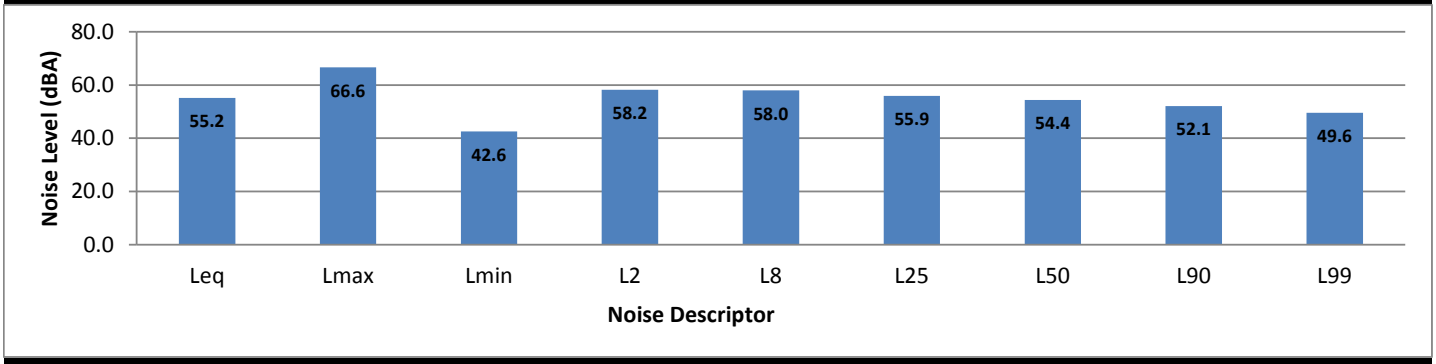
Short-Term Noise Level Measurement Summary

Project Name:	Polopolus (Site 2 Car Wash)	*JN:*	11336
Measurement ID:	S3 - Second Floor	*Analyst:*	A. Wolfe
Measurement Location:	7032 College Park Drive within Site 2	*Date:*	2/22/2018
Sound Level Meter:	SoftdB Piccolo Type 2		
Response:	Slow		
Noise Source:	Existing traffic volumes on Riverboat Drive and Hamner Avenue.		

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:00:00 AM	11:00:00 AM	1:00:00

S3 - Second Floor

Noise Levels (dBA)



Measurement Results (dBA)

L_{eq}	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	L_{90}	L_{99}
55.2	66.6	42.6	58.2	58.0	55.9	54.4	52.1	49.6

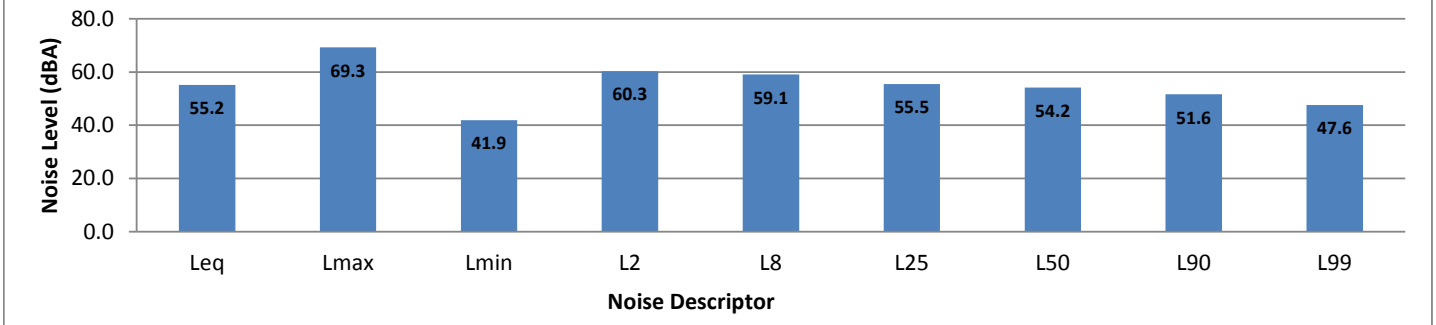
Short-Term Noise Level Measurement Summary

Project Name:	Polopolus (Site 2 Car Wash)	*JN:*	11336
Measurement ID:	S4	*Analyst:*	A. Wolfe
Measurement Location:	7042 College Park Drive within Site 2	*Date:*	2/22/2018
Sound Level Meter:	SoftdB Piccolo Type 2		
Response:	Slow		
Noise Source:	Existing traffic volumes on Riverboat Drive and Hamner Avenue.		

Measurement Time (hh:mm:ss)		
Start	*Stop*	*Duration*
10:00:00 AM	11:00:00 AM	1:00:00

S4

Noise Levels (dBA)



Measurement Results (dBA)

L_{eq}	L_{max}	L_{min}	L_2	L_8	L_{25}	L_{50}	L_{90}	L_{99}
55.2	69.3	41.9	60.3	59.1	55.5	54.2	51.6	47.6

URBAN CROSSROADS

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scholar Wy.
Road Segment: n/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	730 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-3.32	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.56	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.51	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:	64.3	62.4	60.6	54.5	63.2	63.8
Medium Trucks:	58.0	56.5	50.2	48.6	57.1	57.3
Heavy Trucks:	58.9	57.5	48.4	49.7	58.0	58.1
Vehicle Noise:	66.1	64.4	61.2	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	51	109	235
CNEL:	25	54	117	252

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Scholar Wy.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	700 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-3.50	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.74	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.69	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:	64.1	62.2	60.4	54.4	63.0	63.6
Medium Trucks:	57.8	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	58.7	57.3	48.2	49.5	57.8	58.0
Vehicle Noise:	65.9	64.2	61.0	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	228
CNEL:	24	53	114	245

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: n/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,530 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.08	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.16	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.11	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	57.8	66.4	67.0
Medium Trucks:	61.2	59.7	53.4	51.8	60.3	60.5
Heavy Trucks:	62.1	60.7	51.6	52.9	61.2	61.4
Vehicle Noise:	69.3	67.6	64.4	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	126	272	585
CNEL:	63	135	291	628

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: s/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,280 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.63	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.61	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.57	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.1	63.4	57.3	65.9	66.5
Medium Trucks:	60.8	59.3	52.9	51.4	59.8	60.1
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	68.9	67.1	64.0	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	253	546
CNEL:	59	126	272	586

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: s/o 68th St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.65	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-16.59	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-20.54	-1.84	-1.20	-5.25	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:	66.1	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	59.8	58.3	52.0	50.4	58.9	59.1
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.9	66.2	63.0	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	101	218	470
CNEL:	50	109	234	504

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: s/o Riverboat Dr.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,620	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.23	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.01	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.96	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	64.0	57.9	66.5	67.1
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	69.5	67.7	64.6	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	129	278	599
CNEL:	64	138	298	642

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,240	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.55	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.69	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.64	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	60.7	59.2	52.9	51.3	59.8	60.0
Heavy Trucks:	61.6	60.1	51.1	52.4	60.7	60.8
Vehicle Noise:	68.8	67.1	63.9	59.2	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	250	540
CNEL:	58	125	269	579

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Hamner Av.
Road Segment: s/o Citrus St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,070	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.92	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-14.32	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.27	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	62.1	60.6	54.2	52.7	61.1	61.4
Heavy Trucks:	62.9	61.5	52.5	53.7	62.1	62.2
Vehicle Noise:	70.2	68.4	65.3	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	143	309	666
CNEL:	71	154	331	714

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Polopolus
Road Name: Limonite Av. | Job Number: 11336
Road Segment: w/o Hamner Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.63	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-14.61	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.57	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.4	58.3	66.9	67.5
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.9	68.1	65.0	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	137	295	636
CNEL:	68	147	317	683

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Polopolus
Road Name: Limonite Av. | Job Number: 11336
Road Segment: e/o Hamner Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,260	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.34	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-12.90	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.85	-1.84	-1.20	-5.25	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:	69.7	67.9	66.1	60.0	68.7	69.3
Medium Trucks:	63.5	62.0	55.6	54.1	62.6	62.8
Heavy Trucks:	64.4	62.9	53.9	55.2	63.5	63.6
Vehicle Noise:	71.6	69.8	66.7	62.0	70.6	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	384	828
CNEL:	89	191	412	888

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Polopolus
Road Name: Limonite Av. | Job Number: 11336
Road Segment: e/o I-15 Fwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,790	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.84	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.40	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.36	-1.84	-1.20	-5.25	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:	69.2	67.3	65.6	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.1	62.3
Heavy Trucks:	63.9	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.1	69.3	66.2	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	165	356	766
CNEL:	82	177	381	822

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project | Project Name: Polopolus
Road Name: 68th St. | Job Number: 11336
Road Segment: w/o Hamner Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.41	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.65	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.60	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.2	62.3	60.6	54.5	63.1	63.7
Medium Trucks:	58.0	56.5	50.1	48.6	57.0	57.3
Heavy Trucks:	58.8	57.4	48.4	49.6	58.0	58.1
Vehicle Noise:	66.1	64.3	61.2	56.5	65.0	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	59	128	276
CNEL:	30	64	137	296

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: 68th St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,280	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.88	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-18.12	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.07	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	63.9	62.1	56.0	64.7	65.3
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	49.9	51.2	59.5	59.7
Vehicle Noise:	67.6	65.9	62.7	58.0	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	349
CNEL:	37	81	174	374

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Riverboat Dr.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	380	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	37.0	feet
Centerline Dist. to Observer:	37.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.64	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-22.88	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-26.84	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:	61.6	59.7	57.9	51.8	60.5	61.1
Medium Trucks:	55.6	54.1	47.7	46.1	54.6	54.8
Heavy Trucks:	56.9	55.5	46.4	47.7	56.0	56.2
Vehicle Noise:	63.6	61.8	58.6	54.0	62.6	63.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	25	55	118
CNEL:	13	27	59	126

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Schleisman Rd.
Road Segment: w/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	900	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.41	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-19.65	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.60	-1.84	-1.20	-5.25	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:	63.0	61.1	59.3	53.3	61.9	62.5
Medium Trucks:	56.8	55.3	48.9	47.3	55.8	56.0
Heavy Trucks:	57.6	56.2	47.1	48.4	56.8	56.9
Vehicle Noise:	64.8	63.1	59.9	55.3	63.8	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	136	294
CNEL:	32	68	146	315

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Schleisman Rd.
Road Segment: e/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	820	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.81	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-20.05	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-24.01	-1.84	-1.20	-5.25	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	60.7	58.9	52.9	61.5	62.1
Medium Trucks:	56.4	54.8	48.5	46.9	55.4	55.6
Heavy Trucks:	57.2	55.8	46.7	48.0	56.3	56.5
Vehicle Noise:	64.4	62.7	59.5	54.9	63.4	63.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	59	128	276
CNEL:	30	64	137	296

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Citrus St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,710 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.38	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.86	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.82	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:	68.0	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.8
Vehicle Noise:	69.8	68.1	64.9	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	414
CNEL:	44	96	206	444

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Citrus St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	220 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-8.53	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-25.77	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-29.72	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:	59.0	57.1	55.4	49.3	57.9	58.6
Medium Trucks:	52.8	51.3	45.0	43.4	51.9	52.1
Heavy Trucks:	53.7	52.2	43.2	44.5	52.8	52.9
Vehicle Noise:	60.9	59.1	56.0	51.3	59.9	60.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	23	49	105
CNEL:	11	24	52	113

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Scholar Wy.
Road Segment: n/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	750 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-3.20	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.44	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.39	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:	64.4	62.5	60.7	54.7	63.3	63.9
Medium Trucks:	58.1	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	59.0	57.6	48.5	49.8	58.1	58.3
Vehicle Noise:	66.2	64.5	61.3	56.6	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	111	239
CNEL:	26	55	119	256

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Scholar Wy.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	730 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-3.32	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.56	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.51	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:	64.3	62.4	60.6	54.5	63.2	63.8
Medium Trucks:	58.0	56.5	50.2	48.6	57.1	57.3
Heavy Trucks:	58.9	57.5	48.4	49.7	58.0	58.1
Vehicle Noise:	66.1	64.4	61.2	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	51	109	235
CNEL:	25	54	117	252

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: n/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,560	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.13	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.11	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.06	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.9	57.8	66.4	67.0
Medium Trucks:	61.3	59.8	53.4	51.9	60.3	60.6
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	69.4	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	63	136	294	633

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: s/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,490	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.01	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.23	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.18	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	69.3	67.5	64.4	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	125	269	579
CNEL:	62	134	288	621

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: s/o 68th St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,100	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.27	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.97	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.92	-1.84	-1.20	-5.25	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:	66.7	64.8	63.0	57.0	65.6	66.2
Medium Trucks:	60.4	58.9	52.6	51.0	59.5	59.7
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.6
Vehicle Noise:	68.5	66.8	63.6	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	240	517
CNEL:	55	119	257	554

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: s/o Riverboat Dr.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,910	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.69	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-14.55	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.51	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	62.7	61.3	52.2	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	298	642
CNEL:	69	148	320	689

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,540	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.10	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-15.14	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.10	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	57.8	66.4	67.0
Medium Trucks:	61.3	59.8	53.4	51.9	60.3	60.5
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	69.3	67.6	64.4	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	126	272	587
CNEL:	63	136	292	629

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Hamner Av.
Road Segment: s/o Citrus St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,250	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.17	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-14.07	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.03	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	63.2	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	70.4	68.7	65.5	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	321	691
CNEL:	74	160	344	742

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Limonite Av.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,920	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.70	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-14.54	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.49	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	139	299	644
CNEL:	69	149	321	691

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Limonite Av.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,390	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.47	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-12.76	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-16.72	-1.84	-1.20	*-5.25*	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:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	63.6	62.1	55.8	54.2	62.7	62.9
Heavy Trucks:	64.5	63.1	54.0	55.3	63.6	63.8
Vehicle Noise:	71.7	70.0	66.8	62.1	70.7	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	182	392	845
CNEL:	91	195	421	906

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Limonite Av.
Road Segment: e/o I-15 Fwy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,820 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.87	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.37	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.32	-1.84	-1.20	-5.25	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:	69.3	67.4	65.6	59.6	68.2	68.8
Medium Trucks:	63.0	61.5	55.2	53.6	62.1	62.3
Heavy Trucks:	63.9	62.5	53.4	54.7	63.0	63.2
Vehicle Noise:	71.1	69.4	66.2	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	166	357	770
CNEL:	83	178	383	826

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: 68th St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	940 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.22	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.46	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.41	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.4	62.5	60.8	54.7	63.3	63.9
Medium Trucks:	58.2	56.7	50.3	48.8	57.2	57.5
Heavy Trucks:	59.0	57.6	48.6	49.8	58.2	58.3
Vehicle Noise:	66.3	64.5	61.4	56.7	65.2	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	284
CNEL:	30	66	141	304

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: 68th St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,310 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.78	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-18.02	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.97	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	60.5	59.1	50.0	51.3	59.6	59.8
Vehicle Noise:	67.7	66.0	62.8	58.1	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	164	354
CNEL:	38	82	176	380

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Riverboat Dr.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	620 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	37.0 feet
Centerline Dist. to Observer:	37.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.52	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-20.75	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-24.71	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:	63.7	61.8	60.0	54.0	62.6	63.2
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	59.0	57.6	48.5	49.8	58.2	58.3
Vehicle Noise:	65.7	64.0	60.7	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	164
CNEL:	18	38	81	175

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Schleisman Rd.
Road Segment: w/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	960	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.13	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-19.37	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.32	-1.84	-1.20	-5.25	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:	63.3	61.4	59.6	53.6	62.2	62.8
Medium Trucks:	57.0	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	57.9	56.5	47.4	48.7	57.0	57.2
Vehicle Noise:	65.1	63.4	60.2	55.5	64.1	64.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	142	307
CNEL:	33	71	153	329

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Schleisman Rd.
Road Segment: e/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	930	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.27	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-19.50	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.46	-1.84	-1.20	-5.25	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:	63.1	61.2	59.5	53.4	62.0	62.6
Medium Trucks:	56.9	55.4	49.0	47.5	56.0	56.2
Heavy Trucks:	57.7	56.3	47.3	48.5	56.9	57.0
Vehicle Noise:	65.0	63.2	60.1	55.4	64.0	64.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	139	300
CNEL:	32	69	150	322

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Citrus St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,770	vehicles
Vehicle Speed:	45	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.53	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.71	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.67	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:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.9	68.2	65.0	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	423
CNEL:	45	98	211	454

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
Road Name: Citrus St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	280	vehicles
Vehicle Speed:	45	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-7.48	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-24.72	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-28.67	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:	60.1	58.2	56.4	50.4	59.0	59.6
Medium Trucks:	53.9	52.4	46.0	44.5	52.9	53.1
Heavy Trucks:	54.7	53.3	44.3	45.5	53.9	54.0
Vehicle Noise:	61.9	60.2	57.0	52.4	60.9	61.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	27	57	124
CNEL:	13	29	62	133

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Scholar Wy.
Road Segment: n/o Schleisman Rd.

Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	790	vehicles
Vehicle Speed:	45	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-2.97	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.21	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.17	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:	64.6	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.7
Heavy Trucks:	59.2	57.8	48.8	50.0	58.4	58.5
Vehicle Noise:	66.4	64.7	61.5	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	115	247
CNEL:	27	57	123	265

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Scholar Wy.
Road Segment: s/o Schleisman Rd.

Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	790	vehicles
Vehicle Speed:	45	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-2.97	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.21	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.17	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:	64.6	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.7
Heavy Trucks:	59.2	57.8	48.8	50.0	58.4	58.5
Vehicle Noise:	66.4	64.7	61.5	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	115	247
CNEL:	27	57	123	265

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: n/o Limonite Av.

Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,600	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.61	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.63	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.58	-1.84	-1.20	-5.25	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:	69.0	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	62.8	61.3	54.9	53.4	61.8	62.1
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.9	69.1	66.0	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	344	740
CNEL:	79	171	369	794

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: s/o Limonite Av.

Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,010	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.83	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-14.40	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.36	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.6	58.5	67.1	67.7
Medium Trucks:	62.0	60.5	54.1	52.6	61.1	61.3
Heavy Trucks:	62.9	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	70.1	68.3	65.2	60.5	69.1	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	142	305	657
CNEL:	70	152	327	705

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: s/o 68th St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,560	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.13	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-15.11	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.06	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.9	57.8	66.4	67.0
Medium Trucks:	61.3	59.8	53.4	51.9	60.3	60.6
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	69.4	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	63	136	294	633

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: s/o Riverboat Dr.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,390	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.35	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.89	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.84	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.0	67.7	68.3
Medium Trucks:	62.5	61.0	54.7	53.1	61.6	61.8
Heavy Trucks:	63.4	61.9	52.9	54.2	62.5	62.6
Vehicle Noise:	70.6	68.9	65.7	61.0	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	153	330	711
CNEL:	76	164	354	763

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,930	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.72	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-14.52	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.48	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.5	58.4	67.0	67.6
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	70.0	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	139	300	645
CNEL:	69	149	321	692

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Hamner Av.
Road Segment: s/o Citrus St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,740	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.78	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.46	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.42	-1.84	-1.20	-5.25	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:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	71.0	69.3	66.1	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	352	759
CNEL:	81	175	378	815

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Limonite Av.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,730 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.77	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-13.47	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.43	-1.84	-1.20	-5.25	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:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.8	62.4	53.3	54.6	62.9	63.1
Vehicle Noise:	71.0	69.3	66.1	61.4	70.0	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	163	352	758
CNEL:	81	175	377	813

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Limonite Av.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	51,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,180 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.19	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-12.05	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.00	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.6	68.7	66.9	60.9	69.5	70.1
Medium Trucks:	64.4	62.9	56.5	54.9	63.4	63.6
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	72.4	70.7	67.5	62.9	71.4	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	203	438	943
CNEL:	101	218	470	1,012

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Limonite Av.
Road Segment: e/o I-15 Fwy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	48,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	4,850 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.91	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-12.33	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.29	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	68.4	66.6	60.6	69.2	69.8
Medium Trucks:	64.1	62.6	56.2	54.7	63.1	63.4
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.2	70.4	67.3	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	90	195	419	903
CNEL:	97	209	450	969

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: 68th St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	970 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.08	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.32	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.28	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.6	62.7	60.9	54.8	63.5	64.1
Medium Trucks:	58.3	56.8	50.5	48.9	57.4	57.6
Heavy Trucks:	59.2	57.8	48.7	50.0	58.3	58.4
Vehicle Noise:	66.4	64.7	61.5	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	135	290
CNEL:	31	67	144	311

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: 68th St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	59.0	feet
Centerline Dist. to Observer:	59.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.16	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-17.40	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.36	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	60.2	58.7	52.4	50.8	59.3	59.5
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.4
Vehicle Noise:	68.3	66.6	63.4	58.7	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	181	389
CNEL:	42	90	194	418

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Riverboat Dr.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	390	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	12	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	37.0	feet
Centerline Dist. to Observer:	37.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.53	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-22.77	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-26.72	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:	61.7	59.8	58.0	51.9	60.6	61.2
Medium Trucks:	55.7	54.2	47.8	46.3	54.7	55.0
Heavy Trucks:	57.0	55.6	46.5	47.8	56.1	56.3
Vehicle Noise:	63.7	62.0	58.7	54.1	62.7	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	26	56	120
CNEL:	13	28	60	129

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Schleisman Rd.
Road Segment: w/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,070	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.66	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-18.90	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.85	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.7	61.9	60.1	54.0	62.7	63.3
Medium Trucks:	57.5	56.0	49.6	48.1	56.6	56.8
Heavy Trucks:	58.4	56.9	47.9	49.2	57.5	57.6
Vehicle Noise:	65.6	63.8	60.7	56.0	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	153	330
CNEL:	35	76	164	354

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Schleisman Rd.
Road Segment: e/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	990	vehicles
Vehicle Speed:	45	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:	76.0	feet
Centerline Dist. to Observer:	76.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.99	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-19.23	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.19	-1.84	-1.20	-5.25	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	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.2	55.7	49.3	47.8	56.2	56.5
Heavy Trucks:	58.0	56.6	47.6	48.8	57.2	57.3
Vehicle Noise:	65.2	63.5	60.4	55.7	64.2	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	67	145	313
CNEL:	34	72	156	336

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Citrus St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	1,890 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.81	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.42	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.38	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:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	62.2	60.7	54.3	52.7	61.2	61.4
Heavy Trucks:	63.0	61.6	52.5	53.8	62.2	62.3
Vehicle Noise:	70.2	68.5	65.3	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	442
CNEL:	47	102	220	474

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 Without Project
Road Name: Citrus St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,500 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	350 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-6.51	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-23.75	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-27.70	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:	61.1	59.2	57.4	51.3	60.0	60.6
Medium Trucks:	54.8	53.3	47.0	45.4	53.9	54.1
Heavy Trucks:	55.7	54.3	45.2	46.5	54.8	55.0
Vehicle Noise:	62.9	61.2	58.0	53.3	61.9	62.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	31	67	144
CNEL:	15	33	72	154

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Scholar Wy.
Road Segment: n/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	810 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-2.87	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.10	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.06	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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.5	57.0	50.6	49.1	57.5	57.8
Heavy Trucks:	59.3	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	66.5	64.8	61.7	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	117	251
CNEL:	27	58	125	270

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Scholar Wy.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	810 vehicles
Vehicle Speed:	45 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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-2.87	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.10	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-24.06	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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.5	57.0	50.6	49.1	57.5	57.8
Heavy Trucks:	59.3	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	66.5	64.8	61.7	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	117	251
CNEL:	27	58	125	270

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: n/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,640 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.66	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.58	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.53	-1.84	-1.20	*-5.25*	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:	69.1	67.2	65.4	59.3	68.0	68.6
Medium Trucks:	62.8	61.3	55.0	53.4	61.9	62.1
Heavy Trucks:	63.7	62.3	53.2	54.5	62.8	62.9
Vehicle Noise:	70.9	69.2	66.0	61.3	69.9	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	161	346	746
CNEL:	80	172	371	800

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: s/o Limonite Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,300 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,230 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.14	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-14.10	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.05	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.9	58.8	67.4	68.1
Medium Trucks:	62.3	60.8	54.4	52.9	61.4	61.6
Heavy Trucks:	63.2	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	70.4	68.6	65.5	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	148	320	689
CNEL:	74	159	343	739

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: s/o 68th St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,400 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,840 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.58	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-14.66	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.61	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.3	66.9	67.5
Medium Trucks:	61.8	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9
Vehicle Noise:	69.8	68.1	64.9	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	293	632
CNEL:	68	146	315	678

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: s/o Riverboat Dr.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	36,900 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,690 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.72	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.52	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.47	-1.84	-1.20	*-5.25*	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:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	62.9	61.4	55.0	53.5	61.9	62.2
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	71.0	69.2	66.1	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	75	162	349	753
CNEL:	81	174	375	807

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: s/o Schleisman Rd.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,220 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.13	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-14.11	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.07	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	62.3	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	70.4	68.6	65.5	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	148	319	687
CNEL:	74	159	342	737

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Hamner Av.
Road Segment: s/o Citrus St.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,200 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,920 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.98	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.26	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.21	-1.84	-1.20	*-5.25*	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:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	63.2	61.6	55.3	53.7	62.2	62.4
Heavy Trucks:	64.0	62.6	53.5	54.8	63.1	63.3
Vehicle Noise:	71.2	69.5	66.3	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	78	169	364	784
CNEL:	84	181	390	840

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Limonite Av.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,800 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	3,780 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.82	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-13.41	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.37	-1.84	-1.20	*-5.25*	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:	69.2	67.3	65.6	59.5	68.1	68.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	71.1	69.3	66.2	61.5	70.0	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	165	355	765
CNEL:	82	177	381	820

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Limonite Av.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,100 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	5,310 vehicles
Vehicle Speed:	45 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:	76.0 feet
Centerline Dist. to Observer:	76.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.30	-1.85	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	79.45	-11.94	-1.84	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-15.89	-1.84	-1.20	*-5.25*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.7	68.8	67.0	61.0	69.6	70.2
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.7
Heavy Trucks:	65.3	63.9	54.9	56.1	64.5	64.6
Vehicle Noise:	72.5	70.8	67.7	63.0	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	96	207	445	959
CNEL:	103	222	478	1,029

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Limonite Av.
Road Segment: e/o I-15 Fwy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	48,900 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	4,890 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	78 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	76.0 feet		
Centerline Dist. to Observer:	76.0 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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.94	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-12.30	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.25	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	68.4	66.7	60.6	69.3	69.9
Medium Trucks:	64.1	62.6	56.2	54.7	63.2	63.4
Heavy Trucks:	65.0	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	72.2	70.4	67.3	62.6	71.2	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	91	196	421	908
CNEL:	97	210	452	974

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: 68th St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	10,100 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,010 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	48 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	59.0 feet		
Centerline Dist. to Observer:	59.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.91	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-19.15	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-23.10	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.7	62.8	61.1	55.0	63.6	64.2
Medium Trucks:	58.5	57.0	50.6	49.1	57.5	57.8
Heavy Trucks:	59.3	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	66.6	64.8	61.7	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	138	298
CNEL:	32	69	148	319

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: 68th St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	15,400 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,540 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	48 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	59.0 feet		
Centerline Dist. to Observer:	59.0 feet		
Barrier Distance to Observer:	0.0 feet		
Observer Height (Above Pad):	5.0 feet		
Pad Elevation:	0.0 feet		
Road Elevation:	0.0 feet		
Road Grade:	0.0%		
Left View:	-90.0 degrees		
Right View:	90.0 degrees		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	54.129
Medium Trucks:	53.966
Heavy Trucks:	53.982

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.08	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	79.45	-17.31	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-21.27	-0.60	-1.20	-5.35	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.7	62.9	56.8	65.5	66.1
Medium Trucks:	60.3	58.8	52.5	50.9	59.4	59.6
Heavy Trucks:	61.2	59.8	50.7	52.0	60.3	60.5
Vehicle Noise:	68.4	66.7	63.5	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	85	183	394
CNEL:	42	91	196	423

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Riverboat Dr.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	6,300 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	630 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	40 mph		
Near/Far Lane Distance:	12 feet		
Site Data		**Vehicle Mix**	
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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	36.851
Medium Trucks:	36.610
Heavy Trucks:	36.634

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.45	1.88	-1.20	-4.56	0.000	0.000
Medium Trucks:	77.72	-20.68	1.93	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-24.64	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:	63.8	61.9	60.1	54.0	62.7	63.3
Medium Trucks:	57.8	56.3	49.9	48.3	56.8	57.0
Heavy Trucks:	59.1	57.7	48.6	49.9	58.2	58.4
Vehicle Noise:	65.8	64.0	60.8	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	77	165
CNEL:	18	38	82	177

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Schleisman Rd.
Road Segment: w/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	11,400 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,140 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	78 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	76.0 feet		
Centerline Dist. to Observer:	76.0 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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.38	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-18.62	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.58	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.0	62.1	60.4	54.3	62.9	63.5
Medium Trucks:	57.8	56.3	49.9	48.4	56.8	57.1
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	65.9	64.1	61.0	56.3	64.8	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	160	344
CNEL:	37	79	171	369

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Schleisman Rd.
Road Segment: e/o Scholar Wy.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	11,000 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,100 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	78 feet		
Site Data		**Vehicle Mix**	
Barrier Height:	**0.0 feet**		
Barrier Type (0-Wall, 1-Berm):	0.0		
Centerline Dist. to Barrier:	76.0 feet		
Centerline Dist. to Observer:	76.0 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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	65.422
Medium Trucks:	65.286
Heavy Trucks:	65.300

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.54	-1.85	-1.20	-4.73	0.000	0.000
Medium Trucks:	79.45	-18.78	-1.84	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-22.73	-1.84	-1.20	-5.25	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.2	54.1	62.8	63.4
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	65.7	64.0	60.8	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	72	156	336
CNEL:	36	78	167	360

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Citrus St.
Road Segment: w/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	19,500 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	1,950 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	0.95	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.29	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.24	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:	68.5	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	62.3	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	70.4	68.6	65.5	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	97	210	452
CNEL:	48	104	225	484

Wednesday, January 17, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY 2019 With Project
Road Name: Citrus St.
Road Segment: e/o Hamner Av.
Project Name: Polopolus
Job Number: 11336

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS	
Highway Data		**Site Conditions (Hard = 10, Soft = 15)**	
Average Daily Traffic (Adt):	4,000 vehicles	Autos:	15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):	15
Peak Hour Volume:	400 vehicles	Heavy Trucks (3+ Axles):	15
Vehicle Speed:	45 mph		
Near/Far Lane Distance:	36 feet		
Site Data		**Vehicle Mix**	
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		

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	68.46	-5.93	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-23.17	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-27.12	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:	61.6	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	55.4	53.9	47.5	46.0	54.5	54.7
Heavy Trucks:	56.3	54.8	45.8	47.1	55.4	55.5
Vehicle Noise:	63.5	61.7	58.6	53.9	62.5	62.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	34	73	157
CNEL:	17	36	78	168

Wednesday, January 17, 2018

APPENDIX 9.1:

MOTOR CITY WASH WORKS REFERENCE NOISE LEVEL DATA

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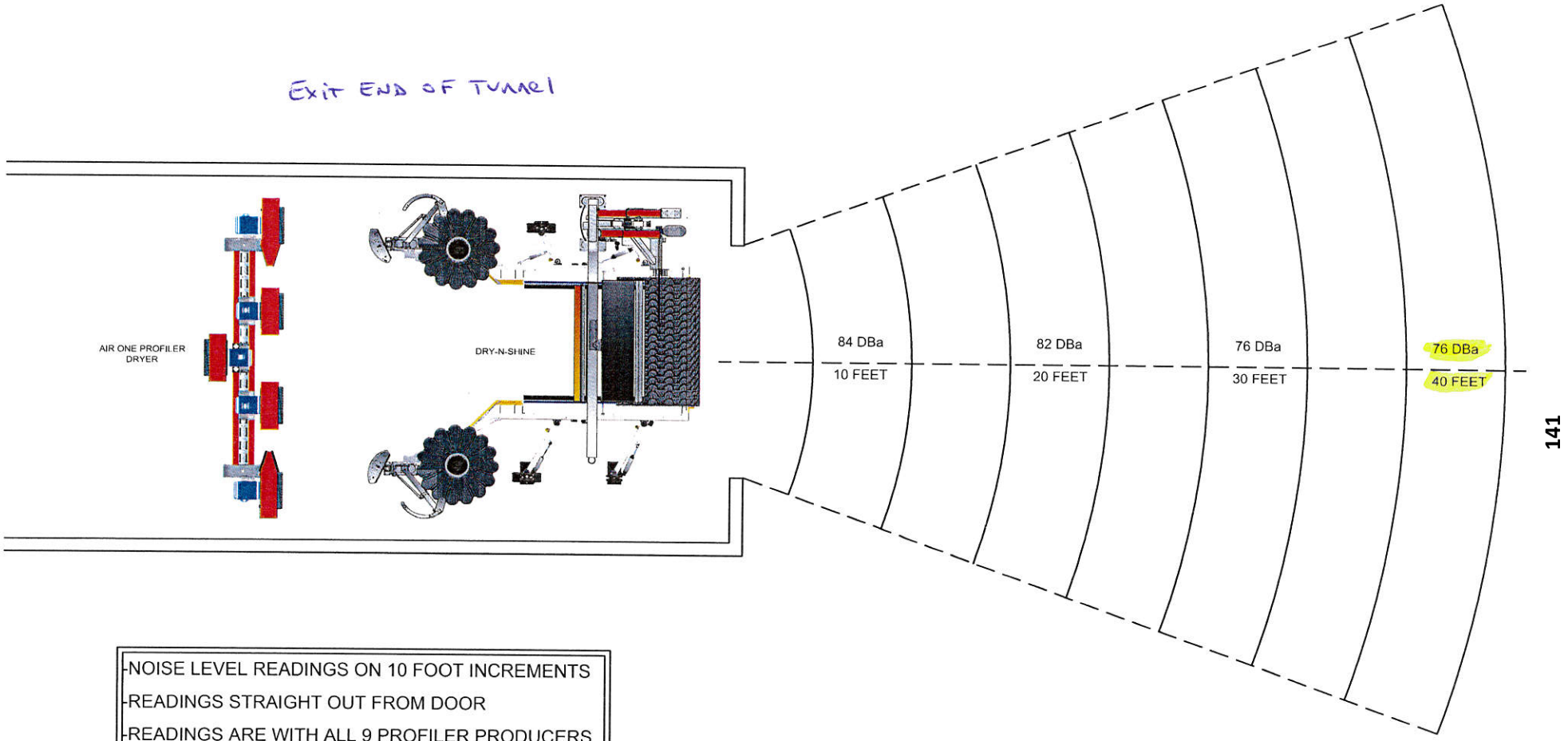
2-27-18

Exit End of Tunnel



-NOISE LEVEL READINGS ON 10 FOOT INCREMENTS
-READINGS STRAIGHT OUT FROM DOOR
-READINGS ARE WITH ALL 9 PROFILER PRODUCERS (90HP TOTAL) "ON" PLUS A DRY N SHINE AT EXIT

NEW

MOTOR CITY WASH WORKS	VEHICLE WASHING EQUIPMENT 48285 Frank Wixom, MI 48393 www.motorcitywashworks.com	IMPORTANT NOTES :	CANTON CARWASH 90HP PROFILER PLUS DRY-N-SHINE SOUND STUDY	ENG-100 DRAWN : JASON LANIGAN DATE : 04/18/2017 SHEET SIZE (A) SCALE : NTS

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APPENDIX 9.2:

SITE 1 OPERATIONAL NOISE LEVEL CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R6**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	623.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	623.0 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:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	623.0	-41.9	-41.9	-41.9	-41.9	-41.9	-41.9
Shielding (Barrier Attenuation)	623.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.3	-41.9	-41.9	-41.9	-41.9	-41.9
39 Minute Hourly Adjustment		**33.4**	**-43.8**	**-43.8**	**-43.8**	**-43.8**	**-43.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R6**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	862.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	862.0 feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	862.0	-35.2	-35.2	-35.2	-35.2	-35.2	-35.2
Shielding (Barrier Attenuation)	862.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.8	-35.2	-35.2	-35.2	-35.2	-35.2
60 Minute Hourly Adjustment		**26.8**	**-35.2**	**-35.2**	**-35.2**	**-35.2**	**-35.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 1/29/2018

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	807.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	807.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	807.0	-33.1	-33.1	-33.1	-33.1	-33.1	-33.1
Shielding (Barrier Attenuation)	807.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.0	-33.1	-33.1	-33.1	-33.1	-33.1
60 Minute Hourly Adjustment		**27.0**	**-33.1**	**-33.1**	**-33.1**	**-33.1**	**-33.1**

STATIONARY SOURCE NOISE PREDICTION MODEL 1/29/2018

Observer Location: **R6**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	640.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	640.0 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:*	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	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	640.0	-42.1	-42.1	-42.1	-42.1	-42.1	-42.1
Shielding (Barrier Attenuation)	640.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		26.1	-42.1	-42.1	-42.1	-42.1	-42.1
60 Minute Hourly Adjustment		**26.1**	**-42.1**	**-42.1**	**-42.1**	**-42.1**	**-42.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R7**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	56.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	46.0 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:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	56.0	-21.0	-21.0	-21.0	-21.0	-21.0	-21.0
Shielding (Barrier Attenuation)	46.0	-7.7	-7.7	-7.7	-7.7	-7.7	-7.7
Raw (Distance + Barrier)		48.5	-28.7	-28.7	-28.7	-28.7	-28.7
39 Minute Hourly Adjustment		**46.6**	**-30.6**	**-30.6**	**-30.6**	**-30.6**	**-30.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R7**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	463.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	453.0 feet	*Noise Source Height:*	3.0 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)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	463.0	-29.8	-29.8	-29.8	-29.8	-29.8	-29.8
Shielding (Barrier Attenuation)	453.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		26.7	-35.3	-35.3	-35.3	-35.3	-35.3
60 Minute Hourly Adjustment		**26.7**	**-35.3**	**-35.3**	**-35.3**	**-35.3**	**-35.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R7**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	99.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	89.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	99.0	-19.4	-19.4	-19.4	-19.4	-19.4	-19.4
Shielding (Barrier Attenuation)	89.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		35.2	-24.9	-24.9	-24.9	-24.9	-24.9
60 Minute Hourly Adjustment		**35.2**	**-24.9**	**-24.9**	**-24.9**	**-24.9**	**-24.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R7**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	227.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	217.0 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)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	227.0	-33.1	-33.1	-33.1	-33.1	-33.1	-33.1
Shielding (Barrier Attenuation)	217.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		29.6	-38.6	-38.6	-38.6	-38.6	-38.6
60 Minute Hourly Adjustment		**29.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R8**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	99.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	89.0 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:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	99.0	-25.9	-25.9	-25.9	-25.9	-25.9	-25.9
Shielding (Barrier Attenuation)	89.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		45.8	-31.4	-31.4	-31.4	-31.4	-31.4
39 Minute Hourly Adjustment		**43.9**	**-33.3**	**-33.3**	**-33.3**	**-33.3**	**-33.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R8**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	837.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	827.0 feet	*Noise Source Height:*	3.0 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)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	837.0	-34.9	-34.9	-34.9	-34.9	-34.9	-34.9
Shielding (Barrier Attenuation)	827.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		21.6	-40.4	-40.4	-40.4	-40.4	-40.4
60 Minute Hourly Adjustment		**21.6**	**-40.4**	**-40.4**	**-40.4**	**-40.4**	**-40.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R8**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	77.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	67.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	77.0	-17.8	-17.8	-17.8	-17.8	-17.8	-17.8
Shielding (Barrier Attenuation)	67.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		36.7	-23.4	-23.4	-23.4	-23.4	-23.4
60 Minute Hourly Adjustment		**36.7**	**-23.4**	**-23.4**	**-23.4**	**-23.4**	**-23.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R8**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	678.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	668.0 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)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	678.0	-42.6	-42.6	-42.6	-42.6	-42.6	-42.6
Shielding (Barrier Attenuation)	668.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		20.1	-48.1	-48.1	-48.1	-48.1	-48.1
60 Minute Hourly Adjustment		**20.1**	**-48.1**	**-48.1**	**-48.1**	**-48.1**	**-48.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R9**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	104.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	94.0	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:	20.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	104.0	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4
Shielding (Barrier Attenuation)	94.0	-5.4	-5.4	-5.4	-5.4	-5.4	-5.4
Raw (Distance + Barrier)		45.4	-31.8	-31.8	-31.8	-31.8	-31.8
39 Minute Hourly Adjustment		**43.5**	**-33.7**	**-33.7**	**-33.7**	**-33.7**	**-33.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R9**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,181.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,171.0	feet	*Noise Source Height:*	3.0 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)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,181.0	-37.9	-37.9	-37.9	-37.9	-37.9	-37.9
Shielding (Barrier Attenuation)	1,171.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		18.6	-43.4	-43.4	-43.4	-43.4	-43.4
60 Minute Hourly Adjustment		**18.6**	**-43.4**	**-43.4**	**-43.4**	**-43.4**	**-43.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R9**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	74.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	64.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	74.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Shielding (Barrier Attenuation)	64.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		36.9	-23.2	-23.2	-23.2	-23.2	-23.2
60 Minute Hourly Adjustment		**36.9**	**-23.2**	**-23.2**	**-23.2**	**-23.2**	**-23.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R9**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,093.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	1,083.0 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)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,093.0	-46.8	-46.8	-46.8	-46.8	-46.8	-46.8
Shielding (Barrier Attenuation)	1,083.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		15.9	-52.3	-52.3	-52.3	-52.3	-52.3
60 Minute Hourly Adjustment		**15.9**	**-52.3**	**-52.3**	**-52.3**	**-52.3**	**-52.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R10**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	243.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	233.0 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:	20.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	243.0	-33.7	-33.7	-33.7	-33.7	-33.7	-33.7
Shielding (Barrier Attenuation)	233.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		38.6	-38.6	-38.6	-38.6	-38.6	-38.6
39 Minute Hourly Adjustment		**36.7**	**-40.5**	**-40.5**	**-40.5**	**-40.5**	**-40.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R10**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	340.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	330.0 feet	*Noise Source Height:*	3.0 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)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	340.0	-27.1	-27.1	-27.1	-27.1	-27.1	-27.1
Shielding (Barrier Attenuation)	330.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		29.3	-32.7	-32.7	-32.7	-32.7	-32.7
60 Minute Hourly Adjustment		**29.3**	**-32.7**	**-32.7**	**-32.7**	**-32.7**	**-32.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R10**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	220.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	210.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	220.0	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7
Shielding (Barrier Attenuation)	210.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		29.9	-30.2	-30.2	-30.2	-30.2	-30.2
60 Minute Hourly Adjustment		**29.9**	**-30.2**	**-30.2**	**-30.2**	**-30.2**	**-30.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R10**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	315.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	305.0 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)	5.0	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	315.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0
Shielding (Barrier Attenuation)	305.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		26.7	-41.5	-41.5	-41.5	-41.5	-41.5
60 Minute Hourly Adjustment		**26.7**	**-41.5**	**-41.5**	**-41.5**	**-41.5**	**-41.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R11**
Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	189.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	189.0	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:	20.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	189.0	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5
Shielding (Barrier Attenuation)	189.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		45.7	-31.5	-31.5	-31.5	-31.5	-31.5
39 Minute Hourly Adjustment		**43.8**	**-33.4**	**-33.4**	**-33.4**	**-33.4**	**-33.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R11**
Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	495.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	495.0	feet	*Noise Source Height:*	3.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

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

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	15.0	62.0	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	495.0	-30.4	-30.4	-30.4	-30.4	-30.4	-30.4
Shielding (Barrier Attenuation)	495.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		31.6	-30.4	-30.4	-30.4	-30.4	-30.4
60 Minute Hourly Adjustment		**31.6**	**-30.4**	**-30.4**	**-30.4**	**-30.4**	**-30.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R11**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	165.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	165.0 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)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	165.0	-22.8	-22.8	-22.8	-22.8	-22.8	-22.8
Shielding (Barrier Attenuation)	165.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		37.3	-22.8	-22.8	-22.8	-22.8	-22.8
60 Minute Hourly Adjustment		**37.3**	**-22.8**	**-22.8**	**-22.8**	**-22.8**	**-22.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

1/29/2018

Observer Location: **R11**
Source: Gas Station Activity
Condition: Operational

Project Name: Polopolus Site 1
Job Number: 11336
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	723.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	723.0 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:*	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	68.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	723.0	-43.2	-43.2	-43.2	-43.2	-43.2	-43.2
Shielding (Barrier Attenuation)	723.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		25.0	-43.2	-43.2	-43.2	-43.2	-43.2
60 Minute Hourly Adjustment		**25.0**	**-43.2**	**-43.2**	**-43.2**	**-43.2**	**-43.2**

APPENDIX 9.3:

SITE 2 OPERATIONAL CADNAA NOISE MODEL INPUTS AND RESULTS

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11336

CadnaA Noise Prediction Model
11336-18 oper contours.cna
Date:
28.02.18
Analyst:
A.Wolfe

Receiver Noise Levels

Name	ID	Level Lr	Limit. Value	Land Use			Height		Coordinates		
		Day	Day	Type	Auto	Noise Type			X	Y	Z
		(dBA)	(dBA)				(m)		(m)	(m)	(m)
R1B	1B	50.8	60.0				1.52	a	1879002.09	699760.87	1.52
R2B	2B	47.2	60.0				1.52	a	1879097.14	699762.86	1.52
R3B	3B	56.4	60.0				1.52	a	1878981.91	699721.19	1.52
R4B	4B	57.0	60.0				1.52	a	1878981.79	699700.12	1.52
R5B	5B	56.9	60.0				1.52	a	1878981.68	699680.51	1.52
R6B	6B	58.5	60.0				1.52	a	1878981.56	699657.77	1.52
R7B	7B	49.8	60.0				1.52	a	1879100.51	699677.98	1.52
R8B	8B	53.9	60.0				1.52	a	1879034.66	699601.99	1.52
R1FF	1FF	48.6	60.0				1.52	a	1879002.21	699763.03	1.52
R3FF	3FF	53.7	60.0				1.52	a	1878978.04	699720.92	1.52
R4FF	4FF	54.0	60.0				1.52	a	1878976.92	699700.11	1.52
R5FF	5FF	53.5	60.0				1.52	a	1878974.32	699680.34	1.52
R6FF	6FF	55.5	60.0				1.52	a	1878975.49	699656.45	1.52
R1SF	1SF	53.5	60.0				4.27	a	1879002.21	699763.03	4.27
R4SF	4SF	58.4	60.0				4.27	a	1878976.92	699700.11	4.27
R5SF	5SF	58.3	60.0				4.27	a	1878974.32	699680.34	4.27
R6SF	6SF	59.4	60.0				4.27	a	1878975.49	699656.45	4.27

Vertical Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m^2)		(min)	(min)	(min)	(dB)	(Hz)	
TunnelExit		TunnelExit	102.8	102.8	102.8	91.1	91.1	91.1	Lw	102.8		0.0	0.0	0.0				300.00	0.00	0.00	3.0	500	(none)

Area Source(s)

Name	Result. PWL		Lw / Li	
	Day	Night	Type	Value
	(dBA)	(dBA)		
Entrance1	95.4	95.4	Lw	95.4
Entrance2	95.4	95.4	Lw	95.4
Vacuums	86.3	86.3	Lw	86.3

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(m)	(m)	(m)	(m)		(m)	
EXISTBARRIER		EXISTBARRIER00001	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00002	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00003	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00004	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00005	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00006	0.21	0.21				1.83	a		
EXISTBARRIER		EXISTBARRIER00007	0.21	0.21				1.83	a		
PLANNEDBARRIERS		0	0.21	0.21				1.83	a		

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	1.83	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0		0	0.21	3.05	a
EXISTINGBUILDINGS		0		0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	6.10	a
EXISTINGBUILDINGS		0	x	0	0.21	3.05	a
PROJBUILDING		0		0	0.21	6.10	a