NOISE IMPACT ANALYSIS

HORSESHOE LAKE PARK MASTER PLAN PROJECT

City of Jurupa Valley

Lead Agency:

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSB	Oriented Strand Board
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
TTM	Tentative Tract Map
UMTA	Federal Urban Mass Transit Administration
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Horseshoe Lake Park Master Plan project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

The project site is located in the southern portion of the City of Jurupa Valley (City) in the general location of 0.1 mile west of Van Buren Boulevard and 0.125 mile north of the Santa Ana River. The project site consists of the existing 13.5-acre Horseshoe Lake Park facility that is largely undeveloped with the exception of an existing gravel-lined walkway, equestrian trails and a horse ring. The project site is bounded by Lakeview Avenue and commercial and residential uses to the northeast, Studio Place and residential uses to the southeast, Kennedy Street and residential uses to the south, and Kelsey Place and residential uses to the west. The project study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest sensitive receptors to the project site are single-family homes located as near as 50 feet to the west side of the project site. There are also single-family homes located as near as 60 feet to the east side of the project site and 70 feet to the north side of the project site. The nearest school to the project site is Pedley Elementary School, which is located as near as 0.7 mile north of the project site.

1.3 Proposed Project Description

The proposed project improvements to the Horseshoe Lake Park would include relocation and expansion of the horse ring to an arena and installation of decomposed granite and concrete walkways, a decomposed granite (D.G.) equestrian trail, exercise station, basketball court, corn hole, minor recreational structures (such as covered play area, picnic shelter, and game tables), interpretive signs, horseshoe pits and a bridge. The proposed site plan is shown in Figure 2.

1.4 Executive Summary

Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City and State of California (State).

City of Jurupa Valley Noise Regulations

The following lists the noise and vibration regulations from the Municipal Code that are applicable, but not limited to the proposed project.

- Section 11.05.020(1) Government Owned Facilities Noise Exemptions
- Section 11.05.020(9) Construction Noise Exemptions
- Section 11.05.040 General Sound Level Standards

State of California Noise Regulations

The following lists the State of California noise regulations that are applicable, but not limited to the proposed project.

- California Vehicle Code Section 2700-27207 – On Road Vehicle Noise Limits
- California Vehicle Code Section 38365-38350 – Off-Road Vehicle Noise Limits

Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

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

Less than significant impact.

Generation of excessive groundborne vibration or groundborne noise levels?

Less than significant impact.

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

No impact.

1.5 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above were adequate to limit all noise and vibration impacts to less than significant levels. No mitigation measures are required for the proposed project with respect to noise and vibration impacts.

SOURCE: Google Maps.

VISTA ENVIRONMENTAL

Figure 1
Project Location Map

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 NOISE FUNDAMENTALS

Noise is 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. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a 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.

2.1 Noise Descriptors

Noise 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 (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) 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 ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Jurupa Valley relies on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound

from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project site is located in the City of Jurupa Valley. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the FTA is the only agency that has defined what constitutes a significant noise impact from implementing a project. The FTA recommends developing construction noise criteria on a project-specific basis that utilizes local noise ordinances if possible. However, local noise ordinances usually relates to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the noise impacts of a construction project. Project construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land uses. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings for a detailed construction noise assessment are provided below in Table A.

Table A – FTA Construction Noise Criteria

Land Use	Day (dBA Leq(8-hour))	Night (dBA Leq(8-hour))	30-day Average (dBA Ldn)
Residential	80	70	75[(1)]
Commercial	85	85	80[(2)]
Industrial	90	90	85[(2)]

Notes:
[(1)] In urban areas with very high ambient noise levels (Ldn > 65 dB), Ldn from construction operations should not exceed existing ambient +10 dB
[(2)] 24-hour Leq not Ldn.
Source: Federal Transit Administration, 2006.

Table B provides the project level permanent noise level increase thresholds utilized by the FTA. As shown in Table B, the allowable cumulative noise level increase created from a project would range from 0 to 7 dBA, which is based on the existing (ambient) noise levels in the project vicinity. The justification for the sliding scale, is that people already exposed to high levels of noise should be expected to tolerate only a small increase in the amount of noise in their community. In contrast, if the existing noise levels are quite low, it is reasonable to allow a greater change in the community noise for the equivalent difference in annoyance.

Table B – FTA Project Effects on Cumulative Noise Exposure

Existing Noise Exposure (dBA Leq or Ldn)	Allowable Noise Impact Exposure dBA Leq or Ldn		
	Project Only	Combined	Noise Exposure Increase
45	51	52	+7
50	53	55	+5
55	55	58	+3
60	57	62	+2
65	60	66	+1
70	64	71	+1
75	65	75	0

Source: Federal Transit Administration, 2006.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One

significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. The land use compatibility guidelines developed by ONC along with other parameters from the California Governor's Office of Planning and Research were used by the City of Jurupa Valley to develop its own land use compatibility standards as described below under Local Regulations.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation- and Construction-Induced Vibration Guidance Manual* in 2004. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established

for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The City of Jurupa Valley General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Jurupa Valley General Plan

The City of Jurupa Valley General Plan includes the following noise and vibration policies that are applicable to the proposed project

Policies

NE 1.1 **Land Use/Noise Compatibility.** Utilize the Land Use/Noise Compatibility Matrix, Figure 7-3, to determine the compatibility of proposed development, including General Plan amendments, specific plan amendments, village plans, and rezonings, with existing land uses and/or noise exposure due to transportation sources.

NE 1.2 **New Development and Stationary Noise Sources.** New development of noise-sensitive land uses near existing stationary noise sources may be permitted only where their location or design allows the development to meet the standards listed in Figure 7-3.

NE 1.3 **New or Modified Stationary Noise Sources.** Noise created by new stationary noise sources, or by existing stationary noise sources that undergo modifications that may increase noise levels, shall be mitigated so as not exceed the noise level standards of Figure 7-3. This policy does not apply to noise levels associated with agricultural operations existing in 2017.

NE 1.4 **Acoustical Assessment.** Require an acoustical assessment for proposed General Plan amendments and rezones that exceed the "Normally Acceptable" thresholds of the Land Use/Noise Compatibility Matrix.

NE 1.5 **Noise Sensitive Uses.** Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL: schools, hospitals, assisted living facilities, mental care facilities, residential uses, libraries, passive recreational uses, and places of worship.

NE 1.6 **Protection of Noise-Sensitive Uses.** Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land uses cannot be relocated, then measures such as building techniques, setbacks, landscaping, and noise walls should be considered.

NE 1.7 **Noise-Tolerant Uses.** Guide new or relocated noise-tolerant land uses into areas irrevocably committed to land uses that are noise producing, such as along major transportation corridors or within the projected noise contours of area airports.

NE 1.8 **Airport Noise Compatibility.** Ensure that new land use development within Airport Influence Areas complies with airport land use noise compatibility criteria contained in the applicable Airport Land Use Compatibility (ALUC) plan for the area.

NE 1.9 **Acoustic Site Planning and Design.** Incorporate acoustic site planning into the design and placement of new development, particularly large scale, mixed-use, or master-planned development, including building orientation, berming, special noise-resistant walls, window and door assemblies, and other appropriate measures.

NE 2.1 **Roadway Projects.** Include noise mitigation measures in the design and construction of new roadway projects in the City. Noise mitigation may include speed reduction, roadway design, noise-reducing materials or surfaces, edge treatments and parkways with berms and landscaping, and other measures.

NE 2.2 **Commercial Truck Deliveries.** Require commercial or industrial truck delivery hours be limited to least-sensitive times of the day when adjacent to noise-sensitive land uses, unless there is no feasible alternative or there are overriding transportation benefits, as determined by the Planning Director.

NE 2.3 **Off-Road Vehicles.** Restrict the use of motorized trail bikes, mini-bikes, and other off-road vehicles except where designated for that purpose. Enforce strict operating hours for these vehicles where they are located to minimize noise impacts on sensitive land uses adjacent to public trails and parks.

NE 2.6 **Noise Contours.** Check all proposed development projects for possible location within roadway, railroad and airport noise contours.

NE 2.8 **Preferred Noise Mitigation Methods.** When approving new development of noise-sensitive uses or noise-generating uses, the City will require noise mitigation in the order of preference, as listed below, with "1" being most preferred. For example, when mitigating outdoor noise exposure, providing distance between source and recipient is preferred to providing berms and walls. Before approving a less desirable approach, the City approval body must make a finding that more desirable use the preferred approaches consistent with other design criteria based on the General Plan.

1. Mitigating Noise Generation
    a. Design the site of the noise-producing project so that buildings or other solid structures shield neighboring noise-sensitive uses; b. Limit the operating times of noise-producing activities;
    b. Limit the operating times of noise-producing activities;
    c. Provide features, such as wall, with a primary purpose of blocking noise.
2. Mitigating Outdoor Noise Exposure
    a. Provide distance between noise source and recipient;
    b. Provide distance plus planted earthen berms;
    c. Provide distance and planted earthen berms, combined with sound walls;

d. Provide sound walls only;

e. Integrate buildings and sound walls to create a continuous noise barrier.

NE 2.10 **Noise Walls.** Noise mitigation walls (sound walls) should be used only when it is shown that other preferred approaches are not effective or that it is not practical to use the preferred approaches consistent with other design criteria in the General Plan. Where noise walls are used, they should be designed to enhance community character, protect significant views, discourage graffiti, and help create an attractive pedestrian-friendly residential setting through features such as setbacks, changes in vertical and horizontal alignment, detail and texture, public art, walkways or trails, and landscaping. The height of such walls should be minimized, and where sound attenuation requires that a buffer that exceeds 10 feet in height, the sound buffer should consist of a combination of berms and a wall, or two or more retaining walls stepped back to allow intervening landscaping.

NE 3.1 **Noise Analysis.** Require that a noise analysis be conducted by an acoustical specialist for all proposed development projects that have the potential to generate significant noise near a noise-sensitive land use, or on or near land designated for noise-sensitive land uses, and ensure that recommended mitigation measures are implemented.

NE 3.4 **Construction Equipment.** Require that all construction equipment utilize noise reduction features (i.e., mufflers and engine shrouds) that are at least as effective as those originally installed by the equipment's manufacturer.

NE 3.5 **Construction Noise.** Limit commercial construction activities adjacent to or within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.

NE 4.1 **Sensitive Land Uses.** Avoid the placement of sensitive land uses adjacent to or within one-quarter mile of vibration-producing land uses.

NE 4.2 **Vibration Producing Land Uses.** Avoid the placement of vibration-producing land uses adjacent to or within one-quarter mile of sensitive receptors.

NE 4.3 **Truck Idling.** Restrict truck idling near sensitive vibration receptors.

City of Jurupa Valley Municipal Code

The Jurupa Valley Municipal Code establishes the following applicable standards related to noise.

Section 11.05.010 - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of City of Jurupa Valley residents and degrade their quality of life. Pursuant to its police power, the City Council declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish city-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (Pub. Resources Code Section 21000 *et seq.*) and no such thresholds are established.

Section 11.05.020. - 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;

(9) Private construction projects located within one-quarter (1/4) of a mile from an inhabited dwelling, provided that:

a) Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

b) Construction does not occur between the hours of six (6:00) p.m. and seven (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 seven (7:00) a.m. and eight (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.

Section 11.05.040. – General sound level standards

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1 [Table C] of this section or that violates the special sound source standards set forth in Section 11.05.060.

Table C – City of Jurupa Valley Municipal Code Sound Level Standards

General Plan Land Use			Maximum Decibel Level	
Designation	**Designation Name**	**Density**	**7 a.m. – 10 p.m.**	**10 p.m. – 7 a.m.**
LDR	Low Density Residential	½ AC	55	45
MDR	Medium Density Residential	2 – 5 DU/AC	55	45
CR	Retail Commercial	--	65	55
OS-R	Open Space Recreation	--	45	45

Source: City of Jurupa Valley Municipal Code Section 11.05.040.

Section 11.05.060. – Special sound source standards.

The general sound level standards set forth in Section 11.05.040 apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this chapter:

(1) Motor vehicles.

a. Off-highway vehicles.

i. No person shall operate an off-highway vehicle unless it is equipped with a USDA-qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.

ii. No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than ninety-six (96) dBA if the vehicle was manufactured on or after January 1, 1986, or is not more than one hundred and one (101) dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.

(2) *Power tools and equipment.* No person shall operate any power tools or equipment between the hours of ten (10:00) p.m. and eight (8:00) a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than one hundred (100) feet from the power tools or equipment. Sound level measurements may be used, but are not required to establish a violation of this subsection.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the proposed project area is generally characterized by vehicle traffic on Van Buren Boulevard (430 feet to northeast) and to a lesser extent, the nearby local roads of Lakeview Avenue, Studio Place, Kennedy Street and Kelsey Place. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The noise measurements were taken using two Extech Model 407780 Type 2 integrating sound level meters programmed in "slow" mode to record the sound pressure level at 3-second intervals for approximately 24 hours in "A" weighted form. In addition, the L_{eq} averaged over the entire measuring time and L_{max} were recorded. The sound level meters and microphones were mounted approximately five to seven feet above the ground and were equipped with a windscreen. The sound level meters were calibrated before and after the monitoring using an Extech calibrator, Model 407766. The noise level measurement equipment meets American National Standards Institute specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

Noise Measurement Location

The noise monitoring locations were selected in order to obtain noise levels on the project site as well as in the vicinity of the nearest residential uses to the project site. Descriptions of the noise monitoring sites are provided below in Table D. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 12:06 p.m. on Wednesday, April 3, 2019 and 12:20 p.m. on Thursday, April 4, 2019. When the noise measurements were started the sky was partly cloudy, the temperature was 65 degrees Fahrenheit, the humidity was 51 percent, barometric pressure was 29.25 inches of mercury, and the wind was blowing around two miles per hour. Overnight, the sky was partly cloudy and the temperature dropped to 51 degrees Fahrenheit. At the conclusion of the noise measurements, the sky was partly cloudy, the temperature was 67 degrees Fahrenheit, the humidity was 44 percent, barometric pressure was 29.26 inches of mercury, and the wind was blowing around three miles per hour.

5.2 Noise Measurement Results

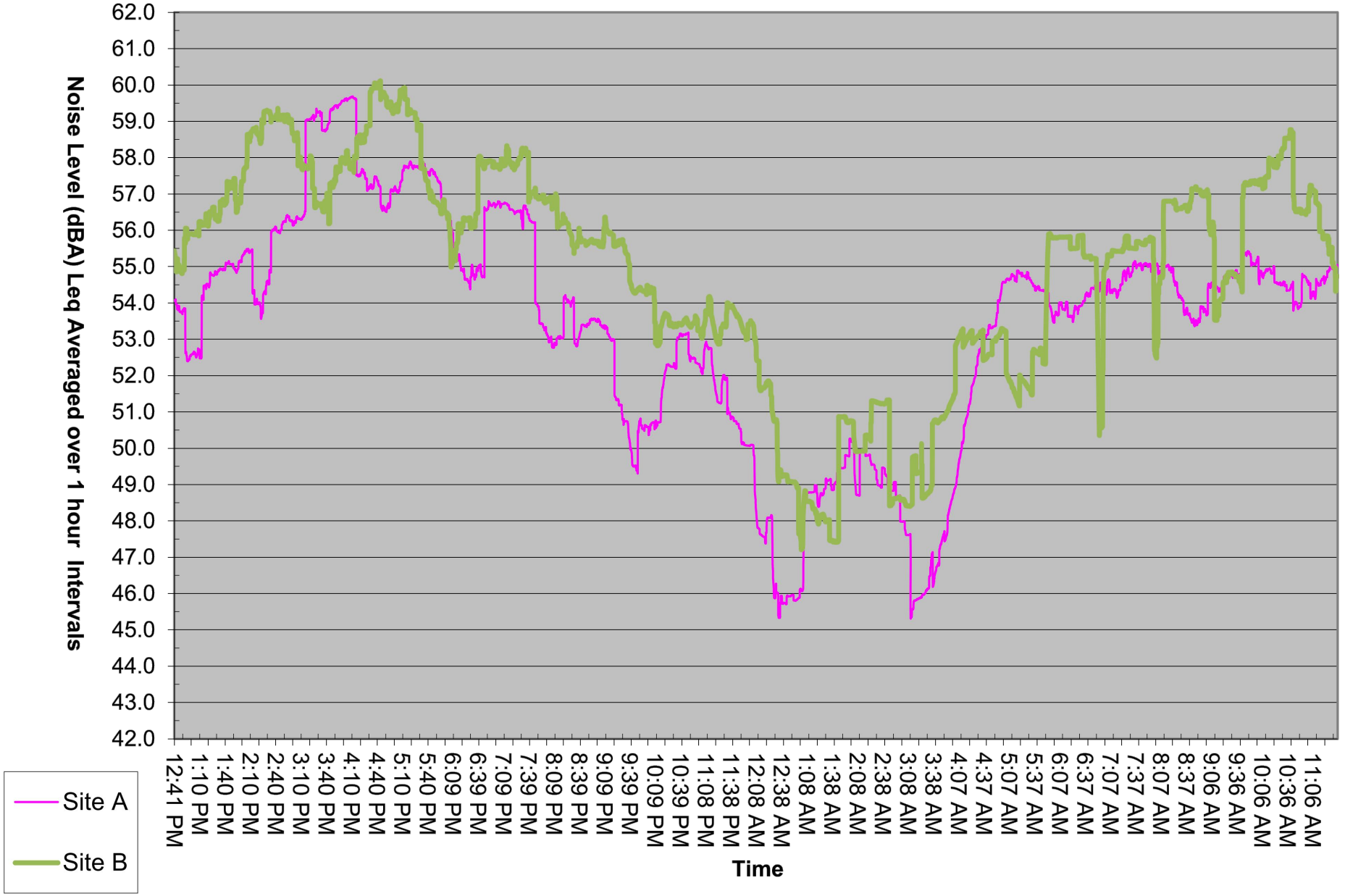
The results of the noise level measurements are presented in Table D. The measured sound pressure levels in dBA have been used to calculate the minimum and maximum L_{eq} averaged over the daytime (7:00 a.m. to 10:00 p.m.), nighttime (10:00 p.m. to 7:00 a.m.) and minimum and maximum 1-hour intervals. Table D also shows the 24-hour CNEL, based on the entire measurement time. The noise monitoring data printouts are included in Appendix B. Figure 3 shows a graph of the 24-hour noise measurements.

Table D – Existing (Ambient) Noise Level Measurements

Site No.	Site Description	Average (dBA L_{eq})		1-hr Average (dBA L_{eq}/Time)		Average (dBA CNEL)
		Daytime[1]	Nighttime[2]	Minimum	Maximum	
1	Located on chain-link fence near north corner of project site, approximately 40 feet south of Lakeview Avenue centerline and 25 feet southeast of Kelsey Place centerline.	55.9	51.0	45.3 12:35 a.m.	59.7 4:08 p.m.	59.2
2	Located on sign post on southeast side of project site, approximately 20 feet northwest of Studio Place centerline and 50 feet from fence at 6862 Studio Place.	57.4	51.9	47.2 1:02 a.m.	60.1 4:37 p.m.	60.3

Notes:
[1] Daytime defined as 7:00 a.m. to 10:00 p.m. (Section 11.05.040 of the Municipal Code)
[2] Nighttime define as 10:0 p.m. to 7:00 a.m. (Section 11.05.040 of the Municipal Code)
Source: Noise measurements taken between Wednesday, April 3, 2019 and Thursday, April 4, 2019.

Table D shows that the both the daytime and nighttime average noise levels at the nearby residential uses, south of the project site currently exceed the City's residential noise standards of 55 dBA Leq during the daytime and 45 dBA Leq during the nighttime.



SOURCE: Extech Model 407780 Type 2 Sound Level Meters.

VISTA ENVIRONMENTAL

Figure 3
Field Noise Measurements Graph

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table E below provides a list of the construction equipment anticipated to be used for each phase of construction as detailed in *Air Quality, Energy and Greenhouse Gas Emissions Impact Analysis Horseshoe Lake Park Master Plan Project* (Air Quality Analysis), prepared by Vista Environmental, April 25, 2019.

Table E – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Site Preparation				
Rubber Tired Dozer	3	40	85	82
Tractor, Loader or Backhoe[5]	4	40	84	N/A
Grading				
Excavator	2	40	85	81
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Tractor, Loader or Backhoe[5]	2	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	3	40	85	83
Generator	1	50	82	81
Tractor, Loader or Backhoe[5]	3	40	84	N/A
Welder	1	40	73	74
Paving				
Paver	2	50	85	77
Paving Equipment	2	50	85	77
Roller	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
[5] For the tractor/loader/backhoe, the tractor noise level was utilized, since it is the loudest of the three types of equipment.
[6] For the cement & mortar mixer, the concrete mixer truck noise level was utilized.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

Table E also shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table E and through use of the RCNM. For each phase of construction, the nearest piece

of equipment was placed at the shortest distance of possible locations for the proposed activity to the nearest sensitive receptor and each subsequent piece of equipment was placed an additional 50 feet away.

6.2 Operations-Related Noise

FHWA Model Methodology

The proposed project would result in increases in traffic noise to the nearby roadways as well as introduce new sensitive receptors to the project site. The project impacts to the offsite roadways were analyzed through use of the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 (FHWA Model). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the reference energy mean emission level to account for: 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) and the percentage of ADT which flows during the day, evening and night, the travel speed, the vehicle mix on the roadway, which is a percentage of the volume of automobiles, medium trucks and heavy trucks, the roadway grade, the angle of view of the observer exposed to the roadway and site conditions ("hard" or "soft" relates to the absorption of the ground, pavement or landscaping). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

FHWA Model Traffic Noise Prediction Model Inputs

The roadway parameters used for this study are presented in Table F. The roadway classifications are based on the City's General Plan Circulation Element. The roadway speeds are based on the posted speed limits. The distance to the nearest sensitive receptor was determined by measuring the distance from the roadway centerline to the nearest residence. Since the study area is located in a suburban environment and landscaping exists along the sides of all analyzed roadways, soft site conditions were modeled.

Table F – FHWA Model Roadway Parameters

Roadway	Segment	General Plan Classification	Vehicle Speed (MPH)	Distance to Nearest Receptor[1] (feet)
Archer Street	North of 64th Street	Local	25	35
Archer Street	North of Kennedy Street	Local	25	35
Studio Place	North of Lakeview Avenue	Local	25	45
Studio Place	North of Kennedy Street	Local	25	40
64th Street	West of Archer Street	Local	25	40
64th Street	East of Archer Street	Local	25	40
Lakeview Avenue	West of Studio Place	Local	25	50
Kennedy Street	West of Archer Street	Local	25	40
Kennedy Street	West of Studio Place	Local	25	60

Notes:
[1] Distance measured from nearest residential structure to centerline of roadway.
Source: Integrated Engineering Group, 2018; and City of Jurupa Valley, 2017.

The average daily traffic (ADT) volumes were obtained from the *Horseshoe Lake Park Traffic Impact Analysis* (Traffic Impact Analysis), prepared by Integrated Engineering Group, November, 2018. The Traffic Impact Analysis provides the PM peak hour volumes for both without project and with project conditions for the existing year (2018) and opening year 2020 scenarios. The ADT volumes used in this analysis are shown in Table G and were calculated by multiplying the PM peak hour volumes by 12.

Table G – FHWA Model Average Daily Traffic Volumes

		Average Daily Traffic Volumes			
Roadway	Segment	Existing 2018	Existing 2018 + Project	Opening Year 2020	Opening Year 2020 + Project
Archer Street	North of 64th Street	2,920	2,939	3,040	3,059
Archer Street	North of Kennedy Street	560	570	580	590
Studio Place	North of Lakeview Avenue	2,580	2,599	2,680	2,699
Studio Place	North of Kennedy Street	340	379	350	389
64th Street	West of Archer Street	1,340	1,379	1,390	1,429
64th Street	East of Archer Street	3,080	3,138	3,220	3,278
Lakeview Avenue	West of Studio Place	2,780	2,838	2,890	2,948
Kennedy Street	West of Archer Street	680	699	710	729
Kennedy Street	West of Studio Place	420	449	430	459

Source: Integrated Engineering Group, 2018.

The vehicle mix used in the FHWA-RD-77-108 Model is shown below in Table H. The vehicle mix is based on the typical vehicle mix observed in Southern California for similar local roadways.

Table H – Local Roadway Vehicle Mix

	Traffic Flow Distributions			
Vehicle Type	Day (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)	Overall
Automobiles	73.60%	13.60%	10.22%	97.42%
Medium Trucks	0.90%	0.90%	0.04%	1.84%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%

Source: Vista Environmental.

FHWA Model Source Assumptions

To assess the roadway noise generation in a uniform manner, all vehicles are analyzed at the single lane equivalent acoustic center of the roadway being analyzed. In order to determine the height above the road grade where the noise is being emitted from, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

6.3 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table I gives approximate vibration levels for particular construction activities. The data in Table I provides a reasonable estimate for a wide range of soil conditions.

Table I – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, May 2006.

The construction-related vibration impacts have been calculated through the vibration levels shown above in Table I and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table E.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the temporary construction activities and long-term operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include site preparation and grading of the 13.5-acre project site, building construction of the bridge, covered play area, picnic shelter and restroom, paving of the onsite sidewalks and basketball court, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are single-family homes located as near as 50 feet to the west side of the project site. There are also single-family homes located as near as 60 feet to the east side of the project site and 70 feet to the north side of the project site.

Section 11.05.020(13) of the Municipal Code exempts construction noise from the City noise standards that occurs between 6:00 a.m. and 6:00 p.m. during the months of June through September and between 7:00 a.m. and 6:00 p.m. during the months of October through May. In addition the City's General Plan Policy NE 3.5 limits construction activities that occur within 200 feet of residential uses to weekdays between 7:00 a.m. and 6:00 p.m. and limits high noise generating construction activities (e.g., grading, demolition, pile driving) to weekdays between 9:00 a.m. and 3:00 p.m.. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents.

In order to determine if the proposed construction activities would create a significant substantial temporary noise increase, the FTA construction noise criteria thresholds detailed above in Section 4.1

have been utilized, which shows that a significant construction noise impact would occur if construction noise exceeds 80 dBA during the daytime at any of the nearby homes.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table E – Construction Equipment Noise Emissions and Usage Factors. The results are shown below in Table J and the RCNM printouts are provided in Appendix C.

Table J – Construction Noise Levels at the Nearest Homes

Construction Phase	Construction Noise Level (dBA Leq) at:		
	Homes to West[1]	Homes to East[2]	Homes to North[2]
Site Preparation	79.8	78.6	77.6
Grading	79.2	78.1	77.2
Building Construction	66.3	68.8	69.9
Paving	71.9	65.0	68.5
Painting	54.6	58.1	59.7
FTA Construction Noise Threshold[3]	**80**	**80**	**80**
Exceed Thresholds?	**No**	**No**	**No**

[1] The nearest homes to west are located on the west side of Kelsey Place and are as near as 50 feet west of the project site.
[2] The nearest homes to east are located on the east side of Studio Place and are as near as 60 feet east of the project site.
[3] The nearest homes to north are located on the northeast side of Lakeview Avenue and are as near as 70 feet north of the project site.
[3] FTA Construction Noise Threshold obtained from Table A above.
Source: RCNM, Federal Highway Administration, 2006

Table J shows that the greatest noise impacts would occur during the site preparation phase of construction, with a noise level as high as 79.8 dBA Leq at the nearest homes to the west of the project site, which is within the FTA daytime construction noise standard of 80 dBA at the nearby homes. Therefore, through adherence to the limitation of allowable construction times provided in Section 11.05.020(13) of the Municipal Code and as specified in General Plan Policy NE 3.5, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from construction of the proposed project. Impacts would be less than significant.

Operational-Related Noise

Potential noise impacts associated with the on-going operations of the 13.5-acre public park would be from project-generated vehicular traffic on the nearby roadways and from onsite activities, which have been analyzed separately below.

Roadway Vehicular Noise

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

Neither the City's General Plan nor the CEQA Guidelines define what constitutes a "substantial permanent increase to ambient noise levels", as such, this impact analysis has utilized guidance from the Federal Transit Administration for a moderate impact that has been detailed above in Table B.

The potential offsite traffic noise impacts created by the on-going operations of the proposed project have been analyzed through utilization of the FHWA model and parameters described above in Section 6.2 and the FHWA model traffic noise calculation spreadsheets are provided in Appendix D. The proposed project's potential offsite traffic noise impacts have been analyzed for the existing (year 2018) and opening-year (year 2020) conditions that are discussed separately below.

Existing (Year 2018) Conditions

The proposed project's potential offsite traffic noise impacts have been calculated through a comparison of the Existing scenario to the Existing With Project scenario. The results of this comparison are shown in Table K.

Table K – Existing (Year 2018) Project Traffic Noise Contributions

		dBA CNEL at Nearest Receptor[1]			
Roadway	Segment	Existing	Existing Plus Project	Project Contribution	Increase Threshold[2]
Archer Street	North of 64th Street	55.5	55.5	0.0	+3 dBA
Archer Street	North of Kennedy Street	48.3	48.4	0.1	+7 dBA
Studio Place	North of Lakeview Avenue	53.3	53.3	0.0	+5 dBA
Studio Place	North of Kennedy Street	45.3	45.7	0.4	+7 dBA
64th Street	West of Archer Street	51.2	51.4	0.2	+5 dBA
64th Street	East of Archer Street	54.9	54.9	0.0	+5 dBA
Lakeview Avenue	West of Studio Place	52.9	53.0	0.1	+5 dBA
Kennedy Street	West of Archer Street	48.3	48.4	0.1	+7 dBA
Kennedy Street	West of Studio Place	43.5	43.8	0.3	+7 dBA

Notes:
[1] Distance to nearest residential use shown in Table F, does not take into account existing noise barriers.
[2] Increase threshold based on the significance thresholds defined in the General Plan, which is derived from the threshold of human perception.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table K shows that the proposed project's permanent noise increases to the nearby homes from the generation of additional vehicular traffic would not exceed the traffic noise increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing (year 2018) conditions. Impacts would be less than significant.

Opening Year (Year 2020) Conditions

The proposed project's potential offsite traffic noise impacts have been calculated through a comparison of the Opening Year 2020 scenario to the Opening Year 2020 With Project scenario. The results of this comparison are shown in Table L.

Table L – Opening Year (Year 2020) Project Traffic Noise Contributions

Roadway	Segment	dBA CNEL at Nearest Receptor[1]			Increase Threshold[2]
		Opening Year 2020	Opening Year Plus Project	Project Contribution	
Archer Street	North of 64th Street	55.7	55.7	0.0	+3 dBA
Archer Street	North of Kennedy Street	48.5	48.6	0.1	+7 dBA
Studio Place	North of Lakeview Avenue	53.5	53.5	0.0	+5 dBA
Studio Place	North of Kennedy Street	45.4	45.9	0.5	+7 dBA
64th Street	West of Archer Street	51.4	51.5	0.1	+5 dBA
64th Street	East of Archer Street	55.0	55.1	0.1	+3 dBA
Lakeview Avenue	West of Studio Place	53.1	53.2	0.1	+5 dBA
Kennedy Street	West of Archer Street	48.5	48.6	0.1	+7 dBA
Kennedy Street	West of Studio Place	43.6	43.9	0.3	+7 dBA

Notes:
[1] Distance to nearest residential use shown in Table F, does not take into account existing noise barriers.
[2] Increase threshold based on the significance thresholds defined in the General Plan, which is derived from the threshold of human perception.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table L shows that the proposed project's permanent noise increases to the nearby homes from the generation of additional vehicular traffic would not exceed the traffic noise increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the opening year (year 2020) conditions. Impacts would be less than significant.

Onsite Noise Sources

The proposed project improvements to the Horseshoe Lake Park (13.5-acres) would include relocation and expansion of the horse ring to an arena and installation of decomposed granite and concrete walkways, a decomposed granite (D.G.) equestrian trail, exercise station, basketball court, corn hole, minor recreational structures (such as covered play area, picnic shelter, and game tables), interpretive signs, horseshoe pits and a bridge. The operation of the proposed project may create an increase in noise levels from noise created from children playing in the play areas, the nature trails, relocated horse arena, and basketball courts, to the nearby homes that are located on the west, east, and north sides of the Horseshoe Lake Park.

Section 11.05.040 of the City's Municipal Code limits noise generated from onsite activities at the nearby residential properties to 55 dBA Leq between the hours of 7:00 a.m. and 10:00 p.m. and 45 dBA Leq between the hours of 10:00 p.m. and 7:00 a.m..

In order to determine the noise impacts from rooftop mechanical equipment, parking lot activities, delivery truck activities, carwash activities, and gas dispensing activities, reference noise measurements were taken of each noise source and are shown below in Table M. Table M also shows the anticipated noise level from each source at the nearest homes located west, east and north of the Park. The operational reference noise measurements are shown in Appendix E.

Table M – Operational Noise Levels at the Nearby Sensitive Receptors

Noise Source	Homes West of Project Site		Homes East of Project Site		Homes North of Project Site	
	Distance Receptor to Source (feet)	Noise Level[1] (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level[1] (dBA L_{eq})	Distance Receptor to Source (feet)	Noise Level[1] (dBA L_{eq})
Nature Trails[2]	80	14.9	80	14.9	80	14.9
Horse Arena	90	33.9	500	15.3	900	8.9
Children Playing	350	18.3	300	19.9	200	24.3
Basketball Courts	550	33.7	320	39.6	200	44.7
Combined Noise Levels		**36.9**		**39.7**		**44.8**
City Noise Standards (Day/Night)		**55/45**		**55/45**		**55/45**
Exceed City Noise Standards (Day/Night)?		**No/No**		**No/No**		**No/No**

Notes:
[1] The noise levels were calculated through use of soft site geometric spreading of noise from a point source with a drop-off rate of 7.5 dB for each doubling of the distance between the source and receiver.
[2] The nature trails were based on a noise measurement 5 feet from a nature trail that produced a noise level of 45.0 dBA Leq.
[3] The horse arena was based on a noise measurement 15 feet from a horse arena during a western style competition that produced a noise level of 53.4 dBA Leq.
[4] The Children playing was based on a noise measurement 5 feet from a jungle gym during recess at an elementary school that produced a noise level of 64.4 dBA Leq.
[5] The basketball courts were based on a noise measurement 40 feet from several basketball courts with a youth club team practice that produced a noise level of 62.2 dBA Leq.

Table M shows that the proposed onsite noise sources may create combined noise levels as high as 36.9 dBA Leq at the nearest homes located on the west side of the project site, as high as 39.7 dBA Leq at the nearest homes located east of the project site, and as high as 44.8 dBA Leq at the nearest homes located on the north side of the project site. The calculated noise levels from onsite sources would be below both the daytime noise standards of 55 dBA Leq and nighttime noise standards of 45 dBA Leq. It should also be noted that the calculated onsite noise levels would be well below the measured daytime noise levels shown above in Table D of 55.9 dBA Leq at the nearby homes on the north and west sides of the project site and 57.4 dBA Leq on the east side of the project site. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels from onsite noise sources. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of the 13.5-acre project site, building construction of the bridge, covered play area, picnic shelter and restroom, paving of the onsite sidewalks and basketball court, and application of architectural coatings. Vibration impacts from construction activities associated with the proposed project would typically be

created from the operation of heavy off-road equipment. The nearest sensitive receptors to the project site are single-family homes located as near as 50 feet to the south of the project site.

Since neither the City's General Plan or Municipal Code do not provide a quantifiable vibration level threshold, Caltrans guidance that is detailed above in Section 4.2 has been utilized, which defines the threshold of perception from transient sources at 0.25 inch per second PPV.

The primary source of vibration during construction would be from the operation of a bulldozer. From Table I above a large bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest offsite receptor (50 feet away) would be 0.04 inch per second PPV. The vibration level at the nearest offsite receptor would be within the 0.25 inch per second PPV threshold detailed above. Impacts would be less than significant.

Operations-Related Vibration Impacts

The on-going operation of the proposed project would not include the operation of any known vibration sources other than normal vehicle operations onsite. Therefore, a less than significant vibration impact is anticipated from the operation of the proposed project.

Level of Significance

Less than significant impact.

7.4 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The nearest airport is Riverside Municipal Airport that is located approximately 1.7 mile southeast of the project site. The project site is located outside of the 60 dBA CNEL noise contours of Riverside Municipal Airport. No impact would occur from aircraft noise.

Level of Significance

No impact.

8.0 REFERENCES

California Department of Transportation, *2016 Annual Average Daily Truck Traffic on the California State Highway System*, 2018.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction-Induced Vibration Guidance Manual*, September 2013.

City of Jurupa Valley, *City of Jurupa Valley California Draft 2017 General Plan*, April, 2017.

City of Jurupa Valley, *Jurupa Valley Municipal Code*, February 27, 2019.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* May 2006.

Integrated Engineering Group, *Vernola Family Park Traffic Impact Analysis,* January 2019.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

Vista Environmental, *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Horseshoe Lake Park Master Plan Project,* April 25, 2019.

APPENDIX A

Field Noise Measurements Photo Index

Noise Measurement Site 1 - looking north

Noise Measurement Site 1 - looking northeast

Noise Measurement Site 1 - looking east

Noise Measurement Site 1 - looking southeast

Noise Measurement Site 1 - looking south

Noise Measurement Site 1 - looking southwest

Noise Measurement Site 1 - looking west

Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

Noise Measurement Site 2 - looking northeast

Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast

Noise Measurement Site 2 - looking south

Noise Measurement Site 2 - looking southwest

Noise Measurement Site 2 - looking west

Noise Measurement Site 2 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

Site 1 - On Fence, North Corner of Project

Date	Time=04/03/19	12:06:00 PM	Leq Daytime	55.9	
Sampling	Time=3	Weighting=A	Leq Nighttim	51.0	
Record	Num=	29000 Weighting=Slow	CNEL(24hr)=	59.2	
Leq	54.4 SEL	Value=104.0	Ldn(24hr)=	58.8	
MAX	84.1	Min Leq1hr =	45.3	12:35 AM	
MIN	33.4	Max Leq1hr =	59.7	4:08 PM	

SPL	Time	Leq (1 hour Avg.)	Ldn	CNEL
48.1	12:06:00		48.1	48.1
64.6	12:06:03		64.6	64.6
62	12:06:06		62	62
56.3	12:06:09		56.3	56.3
61.7	12:06:12		61.7	61.7
54.9	12:06:15		54.9	54.9
54.4	12:06:18		54.4	54.4
65.3	12:06:21		65.3	65.3
59.1	12:06:24		59.1	59.1
69.2	12:06:27		69.2	69.2
56.1	12:06:30		56.1	56.1
60.1	12:06:33		60.1	60.1
54.6	12:06:36		54.6	54.6
55	12:06:39		55	55
58.1	12:06:42		58.1	58.1
64.6	12:06:45		64.6	64.6
56.9	12:06:48		56.9	56.9
58.2	12:06:51		58.2	58.2
52.7	12:06:54		52.7	52.7
62.3	12:06:57		62.3	62.3
54.4	12:07:00		54.4	54.4
58.1	12:07:03		58.1	58.1
59.8	12:07:06		59.8	59.8
55.2	12:07:09		55.2	55.2
58.1	12:07:12		58.1	58.1
59.7	12:07:15		59.7	59.7
63.1	12:07:18		63.1	63.1
63.7	12:07:21		63.7	63.7
64.7	12:07:24		64.7	64.7
57.3	12:07:27		57.3	57.3
62.7	12:07:30		62.7	62.7
66.8	12:07:33		66.8	66.8
61.6	12:07:36		61.6	61.6
56.4	12:07:39		56.4	56.4
60.5	12:07:42		60.5	60.5
60.9	12:07:45		60.9	60.9
57.8	12:07:48		57.8	57.8
59.6	12:07:51		59.6	59.6
60.6	12:07:54		60.6	60.6
58.1	12:07:57		58.1	58.1
58.9	12:08:00		58.9	58.9
57	12:08:03		57	57
59	12:08:06		59	59
58.9	12:08:09		58.9	58.9
56	12:08:12		56	56
55.5	12:08:15		55.5	55.5
52.1	12:08:18		52.1	52.1
54.1	12:08:21		54.1	54.1
50	12:08:24		50	50
46	12:08:27		46	46
49.4	12:08:30		49.4	49.4
44.7	12:08:33		44.7	44.7
57.5	12:08:36		57.5	57.5
51.6	12:08:39		51.6	51.6
53.6	12:08:42		53.6	53.6
55.6	12:08:45		55.6	55.6
54.2	12:08:48		54.2	54.2
52.7	12:08:51		52.7	52.7
51.1	12:08:54		51.1	51.1
50.5	12:08:57		50.5	50.5
55.8	12:09:00		55.8	55.8
59.3	12:09:03		59.3	59.3
62	12:09:06		62	62
50.1	12:09:09		50.1	50.1
44.9	12:09:12		44.9	44.9
45.1	12:09:15		45.1	45.1
46	12:09:18		46	46
53.7	12:09:21		53.7	53.7
55	12:09:24		55	55
53.6	12:09:27		53.6	53.6
49.5	12:09:30		49.5	49.5
46	12:09:33		46	46
46.2	12:09:36		46.2	46.2
45.1	12:09:39		45.1	45.1
45.1	12:09:42		45.1	45.1
44.6	12:09:45		44.6	44.6
49.9	12:09:48		49.9	49.9

Site 2 - On Sign, Southeast Side of Project Site

Date	Time=04/03/19	12:11:00 PM	Leq Daytime	57.4	
Sampling	Time=3	Freq Weighting=	Leq Nighttim	51.9	
Record	Num=	29000 Weighting=Slow	CNEL(24hr)=	60.3	
Leq	55.8 SEL	Value=105.3	Ldn(24hr)=	59.8	
MAX	84.3	Min Leq1hr =	47.2	1:02 AM	
MIN	38.4	Max Leq1hr =	60.1	4:37 PM	

SPL	Time	Leq (1 hour Avg.)	Ldn	CNEL
55.5	12:11:00		55.5	55.5
58.2	12:11:03		58.2	58.2
62.7	12:11:06		62.7	62.7
56.3	12:11:09		56.3	56.3
60.7	12:11:12		60.7	60.7
54.1	12:11:15		54.1	54.1
62.8	12:11:18		62.8	62.8
61.2	12:11:21		61.2	61.2
59.2	12:11:24		59.2	59.2
61.7	12:11:27		61.7	61.7
58.8	12:11:30		58.8	58.8
54.8	12:11:33		54.8	54.8
55.5	12:11:36		55.5	55.5
59.3	12:11:39		59.3	59.3
57.6	12:11:42		57.6	57.6
58.3	12:11:45		58.3	58.3
59	12:11:48		59	59
63.4	12:11:51		63.4	63.4
58.9	12:11:54		58.9	58.9
57.9	12:11:57		57.9	57.9
60.5	12:12:00		60.5	60.5
65.8	12:12:03		65.8	65.8
66.8	12:12:06		66.8	66.8
53.3	12:12:09		53.3	53.3
54.7	12:12:12		54.7	54.7
59	12:12:15		59	59
60.5	12:12:18		60.5	60.5
58.2	12:12:21		58.2	58.2
61.6	12:12:24		61.6	61.6
60.8	12:12:27		60.8	60.8
55.4	12:12:30		55.4	55.4
62.4	12:12:33		62.4	62.4
60.8	12:12:36		60.8	60.8
56.8	12:12:39		56.8	56.8
57.8	12:12:42		57.8	57.8
58.6	12:12:45		58.6	58.6
64.4	12:12:48		64.4	64.4
64.4	12:12:51		64.4	64.4
58.4	12:12:54		58.4	58.4
57.1	12:12:57		57.1	57.1
61.5	12:13:00		61.5	61.5
62.1	12:13:03		62.1	62.1
52.4	12:13:06		52.4	52.4
57.9	12:13:09		57.9	57.9
60.8	12:13:12		60.8	60.8
61.4	12:13:15		61.4	61.4
60.2	12:13:18		60.2	60.2
61.6	12:13:21		61.6	61.6
60.9	12:13:24		60.9	60.9
55.1	12:13:27		55.1	55.1
52.4	12:13:30		52.4	52.4
52.9	12:13:33		52.9	52.9
48.8	12:13:36		48.8	48.8
50.9	12:13:39		50.9	50.9
51.8	12:13:42		51.8	51.8
50.1	12:13:45		50.1	50.1
50.4	12:13:48		50.4	50.4
48.4	12:13:51		48.4	48.4
49.2	12:13:54		49.2	49.2
50.7	12:13:57		50.7	50.7
48.9	12:14:00		48.9	48.9
51.8	12:14:03		51.8	51.8
49	12:14:06		49	49
48.2	12:14:09		48.2	48.2
47.7	12:14:12		47.7	47.7
49.6	12:14:15		49.6	49.6
49.8	12:14:18		49.8	49.8
49	12:14:21		49	49
48.1	12:14:24		48.1	48.1
48.3	12:14:27		48.3	48.3
49.7	12:14:30		49.7	49.7
49.8	12:14:33		49.8	49.8
49.6	12:14:36		49.6	49.6
51	12:14:39		51	51
52.5	12:14:42		52.5	52.5
54.7	12:14:45		54.7	54.7
65.6	12:14:48		65.6	65.6

APPENDIX C

RCNM Model Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Site Preparation

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Homes to West	Residential	55.9	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	100	0
Dozer	No	40		81.7	150	0
Tractor	No	40	84		200	0
Tractor	No	40	84		250	0
Tractor	No	40	84		300	0
Tractor	No	40	84		350	0

			Results			
	Calculated (dBA)			Noise Limits (dBA)		
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	81.7	77.7	N/A	N/A	N/A	N/A
Dozer	75.6	71.7	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Tractor	72.0	68.0	N/A	N/A	N/A	N/A
Tractor	70.0	66.0	N/A	N/A	N/A	N/A
Tractor	68.4	64.5	N/A	N/A	N/A	N/A
Tractor	67.1	63.1	N/A	N/A	N/A	N/A
Total	**82**	**79.8**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Site Preparation

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Homes to East	Residential	57.4	51.9	51.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	60	0
Dozer	No	40		81.7	110	0
Dozer	No	40		81.7	160	0
Tractor	No	40.0	84		210	0
Tractor	No	40.0	84		260	0
Tractor	No	40.0	84		310	0
Tractor	No	40.0	84		360	0

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		80.1	76.1	N/A	N/A	N/A	N/A
Dozer		74.8	70.8	N/A	N/A	N/A	N/A
Dozer		71.6	67.6	N/A	N/A	N/A	N/A
Tractor		71.5	67.6	N/A	N/A	N/A	N/A
Tractor		69.7	65.7	N/A	N/A	N/A	N/A
Tractor		68.2	64.2	N/A	N/A	N/A	N/A
Tractor		66.9	62.9	N/A	N/A	N/A	N/A
	Total	**80**	**78.6**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Site Preparation

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to North	Residential	56	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	70	0
Dozer	No	40		81.7	120	0
Dozer	No	40		81.7	170	0
Tractor	No	40	84		220	0
Tractor	No	40	84		270	0
Tractor	No	40	84		320	0
Tractor	No	40	84		370	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Dozer		78.7	74.8	N/A	N/A	N/A	N/A
Dozer		74.1	70.1	N/A	N/A	N/A	N/A
Dozer		71.0	67.1	N/A	N/A	N/A	N/A
Tractor		71.1	67.2	N/A	N/A	N/A	N/A
Tractor		69.4	65.4	N/A	N/A	N/A	N/A
Tractor		67.9	63.9	N/A	N/A	N/A	N/A
Tractor		66.6	62.6	N/A	N/A	N/A	N/A
	Total	**79**	**77.6**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to West	Residential	55.9	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50	0
Excavator	No	40		80.7	100	0
Grader	No	40	85		150	0
Dozer	No	40		81.7	200	0
Tractor	No	40	84		250	0
Tractor	No	40	84		300	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A
Excavator	74.7	70.7	N/A	N/A	N/A	N/A
Grader	75.5	71.5	N/A	N/A	N/A	N/A
Dozer	69.6	65.6	N/A	N/A	N/A	N/A
Tractor	70.0	66.0	N/A	N/A	N/A	N/A
Tractor	68.4	64.5	N/A	N/A	N/A	N/A
Total	**81**	**79.2**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Grading

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to East	Residential	57	52	51.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	60	0
Excavator	No	40		80.7	110	0
Grader	No	40	85		160	0
Dozer	No	40		81.7	210	0
Tractor	No	40	84		260	0
Tractor	No	40	84		310	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Excavator	79.1	75	N/A	N/A	N/A	N/A
Excavator	73.9	69.9	N/A	N/A	N/A	N/A
Grader	74.9	70.9	N/A	N/A	N/A	N/A
Dozer	69.2	65.2	N/A	N/A	N/A	N/A
Tractor	69.7	65.7	N/A	N/A	N/A	N/A
Tractor	68.2	64.2	N/A	N/A	N/A	N/A
Total	**79**	**78.1**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Grading

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to North	Residential	56	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	70	0
Excavator	No	40		80.7	120	0
Grader	No	40	85		170	0
Dozer	No	40		81.7	220	0
Tractor	No	40	84		270	0
Tractor	No	40	84		320	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Excavator	77.8	73.8	N/A	N/A	N/A	N/A
Excavator	73.1	69.1	N/A	N/A	N/A	N/A
Grader	74.4	70.4	N/A	N/A	N/A	N/A
Dozer	68.8	64.8	N/A	N/A	N/A	N/A
Tractor	69.4	65.4	N/A	N/A	N/A	N/A
Tractor	67.9	63.9	N/A	N/A	N/A	N/A
Total	**78**	**77.2**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Building Construction

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Homes to West	Residential	55.9	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	450	0
Gradall	No	40		83.4	500	0
Gradall	No	40		83.4	550	0
Gradall	No	40		83.4	600	0
Tractor	No	40	84		650	0
Tractor	No	40	84		700	0
Tractor	No	40	84		750	0
Generator	No	50		80.6	800	0
Welder / Torch	No	40		74	850	0

		Calculated (dBA)		Results			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		61.5	53.5	N/A	N/A	N/A	N/A
Gradall		63.4	59.4	N/A	N/A	N/A	N/A
Gradall		62.6	58.6	N/A	N/A	N/A	N/A
Gradall		61.8	57.8	N/A	N/A	N/A	N/A
Tractor		61.7	57.7	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A
Tractor		60.5	56.5	N/A	N/A	N/A	N/A
Generator		56.5	53.5	N/A	N/A	N/A	N/A
Welder / Torch		49.4	45.4	N/A	N/A	N/A	N/A
	Total	**63**	**66.3**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Building Construction

				---- Receptor #2 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Homes to East	Residential	57.4	51.9	51.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	300	0
Gradall	No	40		83.4	350	0
Gradall	No	40		83.4	400	0
Gradall	No	40		83.4	450	0
Tractor	No	40	84		500	0
Tractor	No	40	84		550	0
Tractor	No	40	84		600	0
Generator	No	50		80.6	650	0
Welder / Torch	No	40		74	700	0

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	65.0	57.0	N/A	N/A	N/A	N/A
Gradall	66.5	62.5	N/A	N/A	N/A	N/A
Gradall	65.3	61.4	N/A	N/A	N/A	N/A
Gradall	64.3	60.3	N/A	N/A	N/A	N/A
Tractor	64.0	60.0	N/A	N/A	N/A	N/A
Tractor	63.2	59.2	N/A	N/A	N/A	N/A
Tractor	62.4	58.4	N/A	N/A	N/A	N/A
Generator	58.4	55.3	N/A	N/A	N/A	N/A
Welder / Torch	51.1	47.1	N/A	N/A	N/A	N/A
Total	**67**	**68.8**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Building Construction

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to North	Residential	56	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	250	0
Gradall	No	40		83.4	300	0
Gradall	No	40		83.4	350	0
Gradall	No	40		83.4	400	0
Tractor	No	40	84		450	0
Tractor	No	40	84		500	0
Tractor	No	40	84		550	0
Generator	No	50		80.6	600	0
Welder / Torch	No	40		74	650	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane	66.6	58.6	N/A	N/A	N/A	N/A
Gradall	67.8	63.9	N/A	N/A	N/A	N/A
Gradall	66.5	62.5	N/A	N/A	N/A	N/A
Gradall	65.3	61.4	N/A	N/A	N/A	N/A
Tractor	64.9	60.9	N/A	N/A	N/A	N/A
Tractor	64.0	60.0	N/A	N/A	N/A	N/A
Tractor	63.2	59.2	N/A	N/A	N/A	N/A
Generator	59.0	56.0	N/A	N/A	N/A	N/A
Welder / Torch	51.7	47.7	N/A	N/A	N/A	N/A
Total	**68**	**69.9**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Paving

						---- Receptor #1 ----			
		Baselines (dBA)							
Description	Land Use	Daytime		Evening		Night			
Homes to West	Residential		55.9		51		51.0		

				Equipment Spec	Actual	Receptor	Estimated
	Impact			Lmax	Lmax	Distance	Shielding
Description	Device		Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Paver	No		50		77.2	90	0
Paver	No		50		77.2	140	0
Paver	No		50		77.2	190	0
Paver	No		50		77.2	240	0
Roller	No		20		80	290	0
Roller	No		20		80	340	0

				Results			
	Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening	
Equipment	*Lmax		Leq	Lmax	Leq	Lmax	Leq
Paver		72.1	69.1	N/A	N/A	N/A	N/A
Paver		68.3	65.3	N/A	N/A	N/A	N/A
Paver		65.6	62.6	N/A	N/A	N/A	N/A
Paver		63.6	60.6	N/A	N/A	N/A	N/A
Roller		64.7	57.7	N/A	N/A	N/A	N/A
Roller		63.3	56.4	N/A	N/A	N/A	N/A
Total		**72**	**71.9**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Paving

				---- Receptor #2 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Homes to East	Residential	57.4	51.9	51.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	250	0
Paver	No	50		77.2	300	0
Paver	No	50		77.2	350	0
Paver	No	50		77.2	400	0
Roller	No	20		80	450	0
Roller	No	20		80	500	0

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		63.2	60.2	N/A	N/A	N/A	N/A
Paver		61.7	58.6	N/A	N/A	N/A	N/A
Paver		60.3	57.3	N/A	N/A	N/A	N/A
Paver		59.2	56.1	N/A	N/A	N/A	N/A
Roller		60.9	53.9	N/A	N/A	N/A	N/A
Roller		60.0	53.0	N/A	N/A	N/A	N/A
	Total	**63**	**65.0**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Paving

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to North	Residential	56	51	51

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	150	0
Paver	No	50		77.2	200	0
Paver	No	50		77.2	250	0
Paver	No	50		77.2	300	0
Roller	No	20		80	350	0
Roller	No	20		80	400	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		67.7	64.7	N/A	N/A	N/A	N/A
Paver		65.2	62.2	N/A	N/A	N/A	N/A
Paver		63.2	60.2	N/A	N/A	N/A	N/A
Paver		61.7	58.6	N/A	N/A	N/A	N/A
Roller		63.1	56.1	N/A	N/A	N/A	N/A
Roller		61.9	54.9	N/A	N/A	N/A	N/A
	Total	**68**	**68.5**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Painting

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to West	Residential	55.9	51.0	51.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	450	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		58.6	54.6	N/A	N/A	N/A	N/A
	Total	**59**	**54.6**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Homes to East	Residential	57.4	51.9	51.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	300	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		62.1	58.1	N/A	N/A	N/A	N/A
	Total	**62**	**58.1**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/26/2019
Case Description: Horseshoe Lake Park - Painting

					---- Receptor #3 ----			
		Baselines (dBA)						
Description	Land Use	Daytime		Evening	Night			
Homes to North	Residential	56		51	51			

				Equipment Spec	Actual	Receptor	Estimated
	Impact			Lmax	Lmax	Distance	Shielding
Description	Device		Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No		40		77.7	250	0

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		63.7	59.7	N/A	N/A	N/A	N/A
	Total	**64**	**59.7**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

FHWA Model Traffic Noise Contour Calculation Printouts

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

	Vehicle Mix 1 (Local)				Vehicle Mix 2 (Arterial)				Vehicle Mix 3 (I-15)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evenin	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	63.54%	13.02%	15.23%	91.80%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	1.69%	0.31%	0.85%	2.85%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	2.93%	0.28%	2.14%	5.35%

Road Name: Archer Street **Segment: North of 64th Street**

Average Daily Traffic: 2920 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.74	2.35	-1.20	55.85	53.73	52.41	46.40	54.82	55.45	70 dBA:	**3**	**4**
Medium Trucks	71.09	-21.98	2.35	-1.20	50.26	29.01	35.03	16.74	29.88	32.63	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-25.94	2.35	-1.20	53.95	28.60	25.20	29.85	36.05	36.15	60 dBA:	**16**	**18**
				Total:	**58.69**	**53.75**	**52.50**	**46.50**	**54.89**	**55.52**	55 dBA:	**34**	**38**

Road Name: Archer Street **Segment: North of Kennedy Street**

Average Daily Traffic: 560 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.92	2.35	-1.20	48.68	46.55	45.24	39.23	47.65	48.28	70 dBA:	**1**	**1**
Medium Trucks	71.09	-29.15	2.35	-1.20	43.09	21.84	27.86	9.56	22.71	25.46	65 dBA:	**2**	**3**
Heavy Trucks	78.74	-33.11	2.35	-1.20	46.78	21.43	18.03	22.68	28.88	28.98	60 dBA:	**5**	**6**
				Total:	**51.52**	**46.58**	**45.33**	**39.33**	**47.72**	**48.35**	55 dBA:	**11**	**13**

Road Name: Studio Place **Segment: North of Lakeview Avenue**

Average Daily Traffic: 2580 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-5.28	0.66	-1.20	53.62	51.50	50.18	44.17	52.59	53.22	70 dBA:	**3**	**3**
Medium Trucks	71.09	-22.52	0.66	-1.20	48.03	26.78	32.80	14.51	27.65	30.40	65 dBA:	**7**	**7**
Heavy Trucks	78.74	-26.48	0.66	-1.20	51.73	26.38	22.98	27.63	33.82	33.92	60 dBA:	**15**	**16**
				Total:	**56.46**	**51.53**	**50.27**	**44.27**	**52.66**	**53.29**	55 dBA:	**31**	**35**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Studio Place **Segment: North of Kennedy Street**
Average Daily Traffic: 340 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-14.08	1.45	-1.20	45.61	43.49	42.17	36.16	44.58	45.21	70 dBA:	**1**	**1**
Medium Trucks	71.09	-31.32	1.45	-1.20	40.02	18.77	24.79	6.50	19.64	22.39	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-35.28	1.45	-1.20	43.71	18.36	14.96	19.61	25.81	25.91	60 dBA:	**4**	**4**
				Total:	**48.45**	**43.51**	**42.26**	**36.26**	**44.65**	**45.28**	55 dBA:	**8**	**9**

Road Name: 64th Street **Segment: West of Archer Street**
Average Daily Traffic: 1340 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-8.13	1.45	-1.20	51.56	49.44	48.13	42.12	50.54	51.16	70 dBA:	**2**	**2**
Medium Trucks	71.09	-25.37	1.45	-1.20	45.97	24.72	30.74	12.45	25.60	28.35	65 dBA:	**4**	**5**
Heavy Trucks	78.74	-29.32	1.45	-1.20	49.67	24.32	20.92	25.57	31.77	31.86	60 dBA:	**9**	**10**
				Total:	**54.40**	**49.47**	**48.22**	**42.22**	**50.61**	**51.24**	55 dBA:	**20**	**22**

Road Name: 64th Street **Segment: East of Archer Street**
Average Daily Traffic: 3080 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.51	1.45	-1.20	55.18	53.06	51.74	45.73	54.15	54.78	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.75	1.45	-1.20	49.59	28.34	34.36	16.07	29.21	31.96	65 dBA:	**8**	**8**
Heavy Trucks	78.74	-25.71	1.45	-1.20	53.29	27.93	24.53	29.18	35.38	35.48	60 dBA:	**16**	**18**
				Total:	**58.02**	**53.08**	**51.83**	**45.83**	**54.22**	**54.85**	55 dBA:	**35**	**39**

Road Name: Lakeview Avenue **Segment: West of Studio Place**
Average Daily Traffic: 2780 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.96	-0.04	-1.20	53.24	51.12	49.81	43.80	52.21	52.84	70 dBA:	**3**	**4**
Medium Trucks	71.09	-22.20	-0.04	-1.20	47.65	26.40	32.42	14.13	27.27	30.03	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-26.15	-0.04	-1.20	51.35	26.00	22.60	27.25	33.45	33.54	60 dBA:	**15**	**17**
				Total:	**56.08**	**51.15**	**49.89**	**43.90**	**52.29**	**52.91**	55 dBA:	**33**	**36**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Kennedy Street **Segment: West of Archer Street**

Average Daily Traffic: 680 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.07	1.45	-1.20	48.62	46.50	45.18	39.17	47.59	48.22	70 dBA:	**1**	**1**
Medium Trucks	71.09	-28.31	1.45	-1.20	43.03	21.78	27.80	9.51	22.65	25.40	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-32.27	1.45	-1.20	46.72	21.37	17.97	22.62	28.82	28.92	60 dBA:	**6**	**7**
				Total:	**51.46**	**46.52**	**45.27**	**39.27**	**47.66**	**48.29**	55 dBA:	**13**	**14**

Road Name: Kennedy Street **Segment: West of Studio Place**

Average Daily Traffic: 420 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 59.59 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.17	-1.25	-1.20	43.83	41.70	40.39	34.38	42.80	43.43	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.40	-1.25	-1.20	38.24	16.99	23.01	4.71	17.86	20.61	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-34.36	-1.25	-1.20	41.93	16.58	13.18	17.83	24.03	24.13	60 dBA:	**4**	**5**
				Total:	**46.67**	**41.73**	**40.48**	**34.48**	**42.87**	**43.50**	55 dBA:	**9**	**10**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

	Vehicle Mix 1 (Local)				Vehicle Mix 2 (Arterial)				Vehicle Mix 3 (I-15)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evenin	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	63.54%	13.02%	15.23%	91.80%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	1.69%	0.31%	0.85%	2.85%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	2.93%	0.28%	2.14%	5.35%

Road Name: Archer Street **Segment: North of 64th Street**

Average Daily Traffic: 2939 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.72	2.35	-1.20	55.88	53.75	52.44	46.43	54.85	55.48	70 dBA:	**3**	**4**
Medium Trucks	71.09	-21.95	2.35	-1.20	50.29	29.04	35.06	16.76	29.91	32.66	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-25.91	2.35	-1.20	53.98	28.63	25.23	29.88	36.08	36.18	60 dBA:	**16**	**18**
				Total:	**58.72**	**53.78**	**52.53**	**46.53**	**54.92**	**55.55**	55 dBA:	**35**	**38**

Road Name: Archer Street **Segment: North of Kennedy Street**

Average Daily Traffic: 570 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.84	2.35	-1.20	48.75	46.63	45.32	39.30	47.72	48.35	70 dBA:	**1**	**1**
Medium Trucks	71.09	-29.08	2.35	-1.20	43.16	21.91	27.93	9.64	22.78	25.53	65 dBA:	**2**	**3**
Heavy Trucks	78.74	-33.04	2.35	-1.20	46.86	21.51	18.11	22.76	28.95	29.05	60 dBA:	**5**	**6**
				Total:	**51.59**	**46.66**	**45.40**	**39.40**	**47.79**	**48.42**	55 dBA:	**12**	**13**

Road Name: Studio Place **Segment: North of Lakeview Avenue**

Average Daily Traffic: 2599 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-5.25	0.66	-1.20	53.65	51.53	50.22	44.21	52.62	53.25	70 dBA:	**3**	**3**
Medium Trucks	71.09	-22.49	0.66	-1.20	48.06	26.81	32.83	14.54	27.68	30.44	65 dBA:	**7**	**7**
Heavy Trucks	78.74	-26.44	0.66	-1.20	51.76	26.41	23.01	27.66	33.86	33.95	60 dBA:	**15**	**16**
				Total:	**56.49**	**51.56**	**50.30**	**44.31**	**52.70**	**53.32**	55 dBA:	**32**	**35**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Studio Place **Segment: North of Kennedy Street**

Average Daily Traffic: 379 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.61	1.45	-1.20	46.08	43.95	42.64	36.63	45.05	45.68	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.85	1.45	-1.20	40.49	19.24	25.26	6.96	20.11	22.86	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-34.81	1.45	-1.20	44.18	18.83	15.43	20.08	26.28	26.38	60 dBA:	**4**	**4**
				Total:	**48.92**	**43.98**	**42.73**	**36.73**	**45.12**	**45.75**	55 dBA:	**9**	**10**

Road Name: 64th Street **Segment: West of Archer Street**

Average Daily Traffic: 1379 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-8.00	1.45	-1.20	51.69	49.57	48.25	42.24	50.66	51.29	70 dBA:	**2**	**2**
Medium Trucks	71.09	-25.24	1.45	-1.20	46.10	24.85	30.87	12.58	25.72	28.47	65 dBA:	**4**	**5**
Heavy Trucks	78.74	-29.20	1.45	-1.20	49.79	24.44	21.04	25.69	31.89	31.99	60 dBA:	**10**	**11**
				Total:	**54.53**	**49.59**	**48.34**	**42.34**	**50.73**	**51.36**	55 dBA:	**21**	**23**

Road Name: 64th Street **Segment: East of Archer Street**

Average Daily Traffic: 3138 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.43	1.45	-1.20	55.26	53.14	51.82	45.81	54.23	54.86	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.67	1.45	-1.20	49.67	28.42	34.44	16.15	29.29	32.04	65 dBA:	**8**	**9**
Heavy Trucks	78.74	-25.63	1.45	-1.20	53.37	28.02	24.62	29.26	35.46	35.56	60 dBA:	**17**	**18**
				Total:	**58.10**	**53.17**	**51.91**	**45.91**	**54.30**	**54.93**	55 dBA:	**36**	**40**

Road Name: Lakeview Avenue **Segment: West of Studio Place**

Average Daily Traffic: 2838 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.87	-0.04	-1.20	53.33	51.21	49.90	43.89	52.30	52.93	70 dBA:	**3**	**4**
Medium Trucks	71.09	-22.11	-0.04	-1.20	47.74	26.49	32.51	14.22	27.36	30.12	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-26.06	-0.04	-1.20	51.44	26.09	22.69	27.34	33.54	33.63	60 dBA:	**16**	**17**
				Total:	**56.17**	**51.24**	**49.98**	**43.99**	**52.38**	**53.00**	55 dBA:	**33**	**37**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Kennedy Street **Segment: West of Archer Street**

Average Daily Traffic: 699 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-10.95	1.45	-1.20	48.74	46.62	45.30	39.29	47.71	48.34	70 dBA:	**1**	**1**
Medium Trucks	71.09	-28.19	1.45	-1.20	43.15	21.90	27.92	9.63	22.77	25.52	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-32.15	1.45	-1.20	46.85	21.50	18.10	22.75	28.94	29.04	60 dBA:	**6**	**7**
				Total:	**51.58**	**46.65**	**45.39**	**39.39**	**47.78**	**48.41**	55 dBA:	**13**	**15**

Road Name: Kennedy Street **Segment: West of Studio Place**

Average Daily Traffic: 449 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 59.59 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-12.87	-1.25	-1.20	44.12	42.00	40.68	34.67	43.09	43.72	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.11	-1.25	-1.20	38.53	17.28	23.30	5.01	18.15	20.90	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-34.07	-1.25	-1.20	42.22	16.87	13.47	18.12	24.32	24.42	60 dBA:	**5**	**5**
				Total:	**46.96**	**42.02**	**40.77**	**34.77**	**43.16**	**43.79**	55 dBA:	**10**	**11**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITHOUT PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

	Vehicle Mix 1 (Local)				Vehicle Mix 2 (Arterial)				Vehicle Mix 3 (I-15)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evenin	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	63.54%	13.02%	15.23%	91.80%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	1.69%	0.31%	0.85%	2.85%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	2.93%	0.28%	2.14%	5.35%

Road Name: Archer Street **Segment: North of 64th Street**

Average Daily Traffic: 3040 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.57	2.35	-1.20	56.02	53.90	52.59	46.58	55.00	55.62	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.81	2.35	-1.20	50.43	29.18	35.20	16.91	30.05	32.81	65 dBA:	**8**	**8**
Heavy Trucks	78.74	-25.76	2.35	-1.20	54.13	28.78	25.38	30.03	36.23	36.32	60 dBA:	**16**	**18**
				Total:	**58.86**	**53.93**	**52.67**	**46.68**	**55.07**	**55.70**	55 dBA:	**35**	**39**

Road Name: Archer Street **Segment: North of Kennedy Street**

Average Daily Traffic: 580 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.76	2.35	-1.20	48.83	46.71	45.39	39.38	47.80	48.43	70 dBA:	**1**	**1**
Medium Trucks	71.09	-29.00	2.35	-1.20	43.24	21.99	28.01	9.72	22.86	25.61	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-32.96	2.35	-1.20	46.94	21.58	18.18	22.83	29.03	29.13	60 dBA:	**5**	**6**
				Total:	**51.67**	**46.73**	**45.48**	**39.48**	**47.87**	**48.50**	55 dBA:	**12**	**13**

Road Name: Studio Place **Segment: North of Lakeview Avenue**

Average Daily Traffic: 2680 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-5.12	0.66	-1.20	53.79	51.66	50.35	44.34	52.76	53.38	70 dBA:	**3**	**4**
Medium Trucks	71.09	-22.36	0.66	-1.20	48.19	26.95	32.97	14.67	27.82	30.57	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-26.31	0.66	-1.20	51.89	26.54	23.14	27.79	33.99	34.08	60 dBA:	**15**	**16**
				Total:	**56.62**	**51.69**	**50.44**	**44.44**	**52.83**	**53.46**	55 dBA:	**32**	**36**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITHOUT PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Studio Place **Segment: North of Kennedy Street**

Average Daily Traffic: 350 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.96	1.45	-1.20	45.73	43.61	42.30	36.29	44.71	45.33	70 dBA:	**1**	**1**
Medium Trucks	71.09	-31.20	1.45	-1.20	40.14	18.89	24.91	6.62	19.77	22.52	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-35.15	1.45	-1.20	43.84	18.49	15.09	19.74	25.94	26.03	60 dBA:	**4**	**4**
				Total:	**48.57**	**43.64**	**42.38**	**36.39**	**44.78**	**45.41**	55 dBA:	**8**	**9**

Road Name: 64th Street **Segment: West of Archer Street**

Average Daily Traffic: 1390 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-7.97	1.45	-1.20	51.72	49.60	48.29	42.28	50.70	51.32	70 dBA:	**2**	**2**
Medium Trucks	71.09	-25.21	1.45	-1.20	46.13	24.88	30.90	12.61	25.75	28.51	65 dBA:	**4**	**5**
Heavy Trucks	78.74	-29.16	1.45	-1.20	49.83	24.48	21.08	25.73	31.93	32.02	60 dBA:	**10**	**11**
				Total:	**54.56**	**49.63**	**48.37**	**42.38**	**50.77**	**51.40**	55 dBA:	**21**	**23**

Road Name: 64th Street **Segment: East of Archer Street**

Average Daily Traffic: 3220 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.32	1.45	-1.20	55.37	53.25	51.94	45.92	54.34	54.97	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.56	1.45	-1.20	49.78	28.53	34.55	16.26	29.40	32.16	65 dBA:	**8**	**9**
Heavy Trucks	78.74	-25.51	1.45	-1.20	53.48	28.13	24.73	29.38	35.58	35.67	60 dBA:	**17**	**19**
				Total:	**58.21**	**53.28**	**52.02**	**46.02**	**54.41**	**55.04**	55 dBA:	**37**	**40**

Road Name: Lakeview Avenue **Segment: West of Studio Place**

Average Daily Traffic: 2890 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.79	-0.04	-1.20	53.41	51.29	49.98	43.96	52.38	53.01	70 dBA:	**3**	**4**
Medium Trucks	71.09	-22.03	-0.04	-1.20	47.82	26.57	32.59	14.30	27.44	30.19	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-25.98	-0.04	-1.20	51.52	26.17	22.77	27.42	33.62	33.71	60 dBA:	**16**	**17**
				Total:	**56.25**	**51.32**	**50.06**	**44.06**	**52.45**	**53.08**	55 dBA:	**34**	**37**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITHOUT PROJECT CONDITIONS **Project: Horseshoe Lake Park Master Plan**
Site Conditions: Soft

Road Name: Kennedy Street **Segment: West of Archer Street**
Average Daily Traffic: 710 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-10.89	1.45	-1.20	48.81	46.68	45.37	39.36	47.78	48.40	70 dBA:	**1**	**1**
Medium Trucks	71.09	-28.12	1.45	-1.20	43.21	21.97	27.99	9.69	22.84	25.59	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-32.08	1.45	-1.20	46.91	21.56	18.16	22.81	29.01	29.11	60 dBA:	**6**	**7**
				Total:	**51.64**	**46.71**	**45.46**	**39.46**	**47.85**	**48.48**	55 dBA:	**13**	**15**

Road Name: Kennedy Street **Segment: West of Studio Place**
Average Daily Traffic: 430 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 59.59 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.06	-1.25	-1.20	43.93	41.81	40.49	34.48	42.90	43.53	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.30	-1.25	-1.20	38.34	17.09	23.11	4.82	17.96	20.71	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-34.26	-1.25	-1.20	42.04	16.69	13.29	17.93	24.13	24.23	60 dBA:	**4**	**5**
				Total:	**46.77**	**41.83**	**40.58**	**34.58**	**42.97**	**43.60**	55 dBA:	**9**	**10**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

	Vehicle Mix 1 (Local)				Vehicle Mix 2 (Arterial)				Vehicle Mix 3 (I-15)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evenin	Night	Daily
Automobiles	73.60%	13.60%	10.22%	97.42%	69.50%	12.90%	9.60%	92.00%	63.54%	13.02%	15.23%	91.80%
Medium Trucks	0.90%	0.90%	0.04%	1.84%	1.44%	0.06%	1.50%	3.00%	1.69%	0.31%	0.85%	2.85%
Heavy Trucks	0.35%	0.04%	0.35%	0.74%	2.40%	0.10%	2.50%	5.00%	2.93%	0.28%	2.14%	5.35%

Road Name: Archer Street **Segment: North of 64th Street**

Average Daily Traffic: 3059 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.54	2.35	-1.20	56.05	53.93	52.62	46.60	55.02	55.65	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.78	2.35	-1.20	50.46	29.21	35.23	16.94	30.08	32.83	65 dBA:	**8**	**8**
Heavy Trucks	78.74	-25.74	2.35	-1.20	54.16	28.81	25.41	30.06	36.25	36.35	60 dBA:	**16**	**18**
				Total:	**58.89**	**53.96**	**52.70**	**46.70**	**55.09**	**55.72**	55 dBA:	**36**	**39**

Road Name: Archer Street **Segment: North of Kennedy Street**

Average Daily Traffic: 590 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 35 FEET FROM CENTERLINE (Equiv. Lane Dist: 34.29 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.69	2.35	-1.20	48.90	46.78	45.47	39.45	47.87	48.50	70 dBA:	**1**	**1**
Medium Trucks	71.09	-28.93	2.35	-1.20	43.31	22.06	28.08	9.79	22.93	25.68	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-32.89	2.35	-1.20	47.01	21.66	18.26	22.91	29.10	29.20	60 dBA:	**5**	**6**
				Total:	**51.74**	**46.81**	**45.55**	**39.55**	**47.94**	**48.57**	55 dBA:	**12**	**13**

Road Name: Studio Place **Segment: North of Lakeview Avenue**

Average Daily Traffic: 2699 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-5.09	0.66	-1.20	53.82	51.69	50.38	44.37	52.79	53.42	70 dBA:	**3**	**4**
Medium Trucks	71.09	-22.32	0.66	-1.20	48.23	26.98	33.00	14.70	27.85	30.60	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-26.28	0.66	-1.20	51.92	26.57	23.17	27.82	34.02	34.12	60 dBA:	**15**	**17**
				Total:	**56.66**	**51.72**	**50.47**	**44.47**	**52.86**	**53.49**	55 dBA:	**32**	**36**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Studio Place **Segment: North of Kennedy Street**

Average Daily Traffic: 389 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.50	1.45	-1.20	46.19	44.07	42.75	36.74	45.16	45.79	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.74	1.45	-1.20	40.60	19.35	25.37	7.08	20.22	22.97	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-34.70	1.45	-1.20	44.30	18.95	15.55	20.20	26.39	26.49	60 dBA:	**4**	**5**
				Total:	**49.03**	**44.10**	**42.84**	**36.84**	**45.23**	**45.86**	55 dBA:	**9**	**10**

Road Name: 64th Street **Segment: West of Archer Street**

Average Daily Traffic: 1429 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-7.85	1.45	-1.20	51.84	49.72	48.41	42.40	50.81	51.44	70 dBA:	**2**	**2**
Medium Trucks	71.09	-25.09	1.45	-1.20	46.25	25.00	31.02	12.73	25.87	28.63	65 dBA:	**5**	**5**
Heavy Trucks	78.74	-29.04	1.45	-1.20	49.95	24.60	21.20	25.85	32.05	32.14	60 dBA:	**10**	**11**
				Total:	**54.68**	**49.75**	**48.49**	**42.49**	**50.89**	**51.51**	55 dBA:	**21**	**23**

Road Name: 64th Street **Segment: East of Archer Street**

Average Daily Traffic: 3278 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.24	1.45	-1.20	55.45	53.33	52.01	46.00	54.42	55.05	70 dBA:	**4**	**4**
Medium Trucks	71.09	-21.48	1.45	-1.20	49.86	28.61	34.63	16.34	29.48	32.23	65 dBA:	**8**	**9**
Heavy Trucks	78.74	-25.44	1.45	-1.20	53.56	28.20	24.81	29.45	35.65	35.75	60 dBA:	**17**	**19**
				Total:	**58.29**	**53.35**	**52.10**	**46.10**	**54.49**	**55.12**	55 dBA:	**37**	**41**

Road Name: Lakeview Avenue **Segment: West of Studio Place**

Average Daily Traffic: 2948 Vehicles | Vehicle Speed: 25 MPH | Vehicle Mix: 1 | Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.70	-0.04	-1.20	53.50	51.38	50.06	44.05	52.47	53.10	70 dBA:	**3**	**4**
Medium Trucks	71.09	-21.94	-0.04	-1.20	47.91	26.66	32.68	14.39	27.53	30.28	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-25.90	-0.04	-1.20	51.60	26.25	22.85	27.50	33.70	33.80	60 dBA:	**16**	**18**
				Total:	**56.34**	**51.40**	**50.15**	**44.15**	**52.54**	**53.17**	55 dBA:	**34**	**38**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: OPENING YEAR 2020 WITH PROJECT CONDITIONS

Project: Horseshoe Lake Park Master Plan
Site Conditions: Soft

Road Name: Kennedy Street **Segment: West of Archer Street**

Average Daily Traffic: 729 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 40 FEET FROM CENTERLINE (Equiv. Lane Dist: 39.38 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-10.77	1.45	-1.20	48.92	46.80	45.49	39.48	47.89	48.52	70 dBA:	**1**	**1**
Medium Trucks	71.09	-28.01	1.45	-1.20	43.33	22.08	28.10	9.81	22.95	25.71	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-31.96	1.45	-1.20	47.03	21.68	18.28	22.93	29.13	29.22	60 dBA:	**6**	**7**
				Total:	**51.76**	**46.83**	**45.57**	**39.57**	**47.97**	**48.59**	55 dBA:	**14**	**15**

Road Name: Kennedy Street **Segment: West of Studio Place**

Average Daily Traffic: 459 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 60 FEET FROM CENTERLINE (Equiv. Lane Dist: 59.59 ft)										**Centerline Distance to**		
	Noise Adjustments				**Unmitigated Noise Levels**						**Noise Contour (in feet)**		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-12.78	-1.25	-1.20	44.21	42.09	40.78	34.77	43.19	43.81	70 dBA:	**1**	**1**
Medium Trucks	71.09	-30.02	-1.25	-1.20	38.62	17.37	23.39	5.10	18.25	21.00	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-33.97	-1.25	-1.20	42.32	16.97	13.57	18.22	24.42	24.51	60 dBA:	**5**	**5**
				Total:	**47.05**	**42.12**	**40.87**	**34.87**	**43.26**	**43.89**	55 dBA:	**10**	**11**

APPENDIX E

Reference Noise Measurements Printouts

SLM & RTA Summary
Translated: 11-Jun-2009 10:12:27

File Translated: Z:\Vista Env\2009\090503-Anaheim OCWD Burris Basin\Noise Measurements\Nature Park.slmdl
Model Number: 824
Serial Number: A3176
Firmware Rev: 4.283
Software Version: 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup: SLM&RTA.ssa
Setup Descr: SLM & Real-Time Analyzer
Location: Laguna Coast Wilderness Park
Note 1: 5' from 10 car parking lot
Note 2: 5' from nature trail

Overall Any Data
Start Time: 31-May-2009 12:00:26
Elapsed Time: 00:30:00.1

	A Weight		C Weight		Flat	
Leq:	45.0 dBA		57.4 dBC		60.0 dBF	
SEL:	77.5 dBA		89.9 dBC		92.6 dBF	
Peak:	91.1 dBA		98.4 dBC		102.2 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmax (slow):	68.3 dBA		80.3 dBC		84.4 dBF	
	31-May-2009	12:05:24	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (slow):	35.5 dBA		47.5 dBC		48.9 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11
Lmax (fast):	72.3 dBA		88.3 dBC		91.8 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (fast):	34.5 dBA		46.4 dBC		47.6 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11
Lmax (impulse):	75.7 dBA		92.0 dBC		96.0 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (impulse):	35.0 dBA		48.7 dBC		50.1 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11

Spectra
Start Time: 31-May-2009 12:00:26 Run Time: 00:30:00.1

Freq	Leq 1/3	Leq 1/1	Max 1/3	Max 1/1	Min 1/3	Min 1/1
12.5 Hz	52.8		58.0		27.5	
16.0 Hz	52.2	56.9	54.0	60.2	26.8	32.5
20.0 Hz	51.1		52.3		28.7	
25.0 Hz	52.2		58.7		26.5	
31.5 Hz	50.7	55.8	53.7	62.4	32.2	36.3
40.0 Hz	49.8		58.9		33.3	
50.0 Hz	50.5		64.5		34.0	
63.0 Hz	48.7	53.7	70.0	71.5	34.6	38.7
80.0 Hz	46.9		60.6		33.0	
100 Hz	45.2		59.2		29.9	
125 Hz	43.9	48.4	63.0	66.8	28.1	32.8
160 Hz	40.5		62.9		24.6	
200 Hz	36.7		57.9		22.0	
250 Hz	35.0	40.1	56.1	62.9	20.4	25.3
315 Hz	33.7		59.6		18.5	
400 Hz	33.8		59.1		18.4	
500 Hz	34.1	38.7	56.6	61.9	21.1	25.0

630 Hz	33.8		54.3		20.8	
800 Hz	35.3		56.1		23.0	
1000 Hz	35.5	40.4	54.2	61.7	23.3	27.7
1250 Hz	36.0		59.1		22.3	
1600 Hz	34.6		59.1		20.7	
2000 Hz	33.6	38.5	59.2	64.5	16.9	23.2
2500 Hz	32.7		60.6		16.3	
3150 Hz	30.8		57.6		15.1	
4000 Hz	28.8	34.3	56.4	61.6	14.9	19.8
5000 Hz	28.8		56.5		15.2	
6300 Hz	25.0		55.9		15.1	
8000 Hz	21.2	27.3	51.6	57.5	15.6	20.4
10000 Hz	19.3		44.2		16.2	
12500 Hz	18.6		38.7		16.5	
16000 Hz	19.3	24.3	33.9	40.1	17.9	23.0
20000 Hz	20.5		26.4		19.6	

Ln Start Level: 15 dB

L (1.00)	0.0
L (5.00)	0.0
L (50.00)	0.0
L (90.00)	0.0
L (95.00)	0.0
L (99.00)	0.0

Detector: Slow
Weighting: A
SPL Exceedance Level 1: 85.0 dB Exceeded: 0 times
SPL Exceedance Level 2: 120.0 dB Exceeded: 0 times
Peak-1 Exceedance Level: 105.0 dB Exceeded: 0 times
Peak-2 Exceedance Level: 100.0 dB Exceeded: 0 times
Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

Current Any Data
Start Time: 31-May-2009 12:00:26
Elapsed Time: 00:30:00.1

	A Weight		C Weight		Flat	
Leq:	45.0 dBA		57.4 dBC		60.0 dBF	
SEL:	77.5 dBA		89.9 dBC		92.6 dBF	
Peak:	91.1 dBA		98.4 dBC		102.2 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmax (slow):	68.3 dBA		80.3 dBC		84.4 dBF	
	31-May-2009	12:05:24	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (slow):	35.5 dBA		47.5 dBC		48.9 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11
Lmax (fast):	72.3 dBA		88.3 dBC		91.8 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (fast):	34.5 dBA		46.4 dBC		47.6 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11
Lmax (impulse):	75.7 dBA		92.0 dBC		96.0 dBF	
	31-May-2009	12:05:23	31-May-2009	12:05:03	31-May-2009	12:05:03
Lmin (impulse):	35.0 dBA		48.7 dBC		50.1 dBF	
	31-May-2009	12:10:49	31-May-2009	12:22:11	31-May-2009	12:22:11

Calibrated: 31-May-2009 11:57:31 Offset: -48.5 dB
Checked: 31-May-2009 11:57:31 Level: 94.0 dB

Calibrator	not set	Level:	94.0 dB
Cal Records Count:	1		
Interval Records:	Disabled	Number Interval Records:	0
Time History:	Disabled	Number History Records:	0
Run/Stop Records:		Number Run/Stop Records:	2

	824	Logging	Sound	Level	Meter	Time
Translated:		17-Oct-07	13:37:03			

File	Translated:	C:\Vista	Env\2007\070801	Orange-SullyMiller\Noise\Noise
Model	Number:	824		
Serial	Number:	A3176		
Firmware	Rev:	4.261		
Software	Version:	3.12		
Name:	Vista	Environmental		
Descr1:	1021	Didrikson	Way	
Descr2:	Laguna	Beach,	CA	92651
Setup:	Logging.log			
Setup	Descr:	Untitled		
Location:	15 feet from Horse Arena with a Western Style Competition			
Note	1:00			
Note	2:00			
Leq	53.4			
Min SPL	45.9	Min Leq(1/30min) =	49.0	
Max SPL	76.6	Max Leq(1/30min) =	68.5	

Rec	Date	Time	Leq	Lmax
1	11-Aug-07	12:13:08	Run:Key	
2	11-Aug-07	12:13:08	47.3	49.7
3	11-Aug-07	12:13:09	47.8	47.6
4	11-Aug-07	12:13:10	49.2	48.7
5	11-Aug-07	12:13:11	49.1	49.1
6	11-Aug-07	12:13:12	49.8	50.1
7	11-Aug-07	12:13:13	48.6	49.2
8	11-Aug-07	12:13:14	48.8	49.1
9	11-Aug-07	12:13:15	48.9	49
10	11-Aug-07	12:13:16	48.2	48.8
11	11-Aug-07	12:13:17	47.4	48.4
12	11-Aug-07	12:13:18	47.7	47.9
13	11-Aug-07	12:13:19	46.9	47.8
14	11-Aug-07	12:13:20	47.1	47.5
15	11-Aug-07	12:13:21	46.9	47.1
16	11-Aug-07	12:13:22	47	47.3
17	11-Aug-07	12:13:23	47.6	47.5
18	11-Aug-07	12:13:24	48.2	48
19	11-Aug-07	12:13:25	50.1	49.6
20	11-Aug-07	12:13:26	51.5	51
21	11-Aug-07	12:13:27	48.4	50.8
22	11-Aug-07	12:13:28	50.6	50.3
23	11-Aug-07	12:13:29	50.4	50.7
24	11-Aug-07	12:13:30	49.1	50.2
25	11-Aug-07	12:13:31	48.4	49.5
26	11-Aug-07	12:13:32	47.9	48.9

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.002
User	GT
Job Description	Darnall Charter School Modernization Project
Location	3rd - 5th Grades Recess near Jungle Gym
Measurement Description	
Start Time	Friday, 2018 October 12 10:20:36
Stop Time	Friday, 2018 October 12 10:30:37
Duration	00:10:00.6
Run Time	00:10:00.6
Pause	00:00:00.0
Pre Calibration	Friday, 2018 October 12 09:55:27
Post Calibration	None
Calibration Deviation	---

Note

Located on west side of school, approx 5 feet from children playing during recess
76 F, 29.36 in Hg, 49% Hu, 3mph wind, partly cloudy

Overall Data

LAeq		64.4	dB
LASmax	2018 Oct 12 10:25:38	77.5	dB
LApeak (max)	2018 Oct 12 10:25:38	93.4	dB
LASmin	2018 Oct 12 10:21:48	45.3	dB
LCeq		66.1	dB
LAeq		64.4	dB
LCeq - LAeq		1.7	dB
LAIeq		70.2	dB
LAeq		64.4	dB
LAIeq - LAeq		5.8	dB
Ldn		64.4	dB
LDay 07:00-22:00		64.4	dB
LNight 22:00-07:00		---	dB
Lden		64.4	dB
LDay 07:00-19:00		64.4	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		92.1	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	69.9	dBA
LAS10.00	68.2	dBA
LAS33.30	64.2	dBA
LAS50.00	61.5	dBA
LAS66.60	58.3	dBA
LAS90.00	53.5	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	33 / 229.1	s
LAS > 85.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.2	dB
Under Range Peak	75.9	dB
Noise Floor	17.0	dB
Overload	143.4	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	54.4	54.6	57.5	58.6	56.6	51.3	56.1	60.7	59.1	51.3	39.9	29.6
LZSmax	77.4	64.8	68.2	72.3	72.9	64.0	66.3	74.9	74.3	65.1	55.9	43.3
LZSmin	43.1	49.5	52.8	52.6	49.8	42.7	40.2	40.3	36.6	29.0	20.1	14.1

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	51.8	49.5	47.1	47.2	50.6	51.0	52.3	53.7	52.0	52.7	54.8	53.6
LZSmax	75.3	71.0	66.6	61.6	60.5	58.2	63.9	64.0	65.9	65.6	68.9	68.5
LZSmin	32.2	35.4	36.9	39.7	44.2	38.6	47.5	49.2	46.9	46.5	47.8	45.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	53.6	51.8	48.7	46.6	46.3	46.6	48.8	51.5	52.9	54.3	56.5	56.8
LZSmax	71.6	64.6	60.4	63.2	57.2	56.1	58.6	65.3	64.4	66.6	67.9	75.1
LZSmin	46.2	43.4	40.9	36.8	29.2	31.4	34.0	35.3	35.9	36.2	35.7	33.9

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	55.7	54.3	52.5	48.6	46.3	42.8	37.0	35.3	31.1	27.1	24.6	19.9
LZSmax	71.4	70.2	71.9	60.4	60.8	62.7	48.3	55.4	45.7	38.9	40.0	38.1
LZSmin	33.5	30.7	29.3	26.2	23.3	20.0	17.3	14.1	11.7	9.3	9.4	9.0

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	12 Oct 2018 09:55:27	-25.9
PRM831	26 Sep 2018 15:49:25	-26.2
PRM831	21 Sep 2018 08:51:56	-25.6
PRM831	05 Sep 2018 11:51:21	-25.9
PRM831	13 Jun 2018 13:02:21	-25.7
PRM831	30 Mar 2018 23:00:57	-25.2
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8
PRM831	28 Feb 2018 12:16:10	-25.9
PRM831	30 Jan 2018 23:18:32	-26.2
PRM831	30 Jan 2018 13:42:45	-26.2

File Translated: C:\Vista Env\DKS Associates\05\05133-000 Royal Rangers\Noise\Basket Ball\1.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Revs: 4.272 / 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: logging.log / Untitled
Location:
Note1: 40 feet from basketball court with youth club team
Note2:

Overall Measurement		Current Measurement	
Start Time:	23-Feb-2008 11:04:13	Start Time:	23-Feb-2008 11:04:13
Elapsed Time:	00:20:00.4	Elapsed Time:	00:20:00.4
Leq:	62.2 dBA	Leq:	62.2 dBA
SEL:	93.0 dBA	SEL:	93.0 dBA
Dose: (8 hr)	0.0 %	Dose: (8 hr)	0.0 %
Proj. Dose:	0.2 %	Proj. Dose:	0.2 %
Threshold:	0 dB	Threshold:	0 dB
Criterion:	90 dB	Criterion:	90 dB
Exchange Rate:	3 dB	Exchange Rate:	3 dB

Min:	47.1 dBA	23-Feb-2008 11:13:48	Min:	47.1 dBA	23-Feb-2008 11:13:48
Max:	87.8 dBA	23-Feb-2008 11:06:54	Max:	87.8 dBA	23-Feb-2008 11:06:54
Peak-1:	105.5 dBF	23-Feb-2008 11:06:54	Peak-1:	105.5 dBF	23-Feb-2008 11:06:54
Peak-2:	104.8 dBA	23-Feb-2008 11:06:54	Peak-2:	104.8 dBA	23-Feb-2008 11:06:54

Ln Start Level: 15 dB

L1.00	70.2 dBA	L90.00	53.1 dBA	LDN:	62.2 dBA
L5.00	64.3 dBA	L95.00	51.9 dBA	CNEL:	62.2 dBA
L50.00	56.9 dBA	L99.00	50.0 dBA	Overall Leq:	62.2 dBA

Detector: Slow
Weighting: A

SPL Exceedance Level 1:	115.0	Exceeded:	0 times
SPL Exceedance level 2:	120	Exceeded:	0 times
Peak-1 Exceedance Level:	140	Exceeded:	0 times
Peak-2 Exceedance Level:	140	Exceeded:	0 times

Hysteresis: 2
Overloaded: 0 time(s)
Paused: 0 times for 00:00:00.0

Calibrated:	23-Feb-2008 11:01:21	Offset:	-48.8 dB
Checked:	23-Feb-2008 11:01:21	Level:	94.0 dB
Calibrator	not set	Level:	94.0 dB
Cal Records Count:	1		

Interval Records:	Enabled	Number Interval Records:	1
History Records:	Enabled	Number History Records:	23
Exceedance Records:	Disabled	Number Exceedance Records:	0
Daily Records:	Disabled	Number Daily Records:	0
Run/Stop Records:		Number Run/Stop Records:	2

824 Memory: 2097152 bytes

File Translated: C:\Vista Env\DKS Associates\05\05133-000 Royal Rangers\Noise\Basket Ball\1.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Rev4.272 / 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: logging.log / Untitled
Location:
Note1:
Note2:

Overall Any Data
Start Time: 23-Feb-2008 11:04:13
Elapsed Time: 00:20:00.4

	A Weight		C Weight		Flat	
Leq:	62.2 dBA		65.1 dBC		65.5 dBF	
SEL:	93.0 dBA		95.9 dBC		96.3 dBF	
Peak:	104.8 dBA		105.3 dBC		105.5 dBF	
	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54
Lmax (slow):	87.8 dBA		87.4 dBC		87.5 dBF	
	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54
Lmin (slow):	47.1 dBA		56.2 dBC		57.3 dBF	
	23-Feb-2008	11:13:48	23-Feb-2008	11:22:59	23-Feb-2008	11:22:59
Lmax (fast):	95.2 dBA		94.8 dBC		94.9 dBF	
	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54
Lmin (fast):	41.5 dBA		53.4 dBC		54.5 dBF	
	23-Feb-2008	11:11:45	23-Feb-2008	11:24:03	23-Feb-2008	11:24:03
Lmax (impulse):	97.8 dBA		97.5 dBC		97.5 dBF	
	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54	23-Feb-2008	11:06:54
Lmin (impulse):	52.2 dBA		59.1 dBC		59.8 dBF	
	23-Feb-2008	11:15:08	23-Feb-2008	11:04:13	23-Feb-2008	11:22:59

File Translated: C:\Vista Env\DKS Associates\05\05133-000 Royal Rangers\Noise\Basket Ball\1.slmdl
Model/Serial Number: 824 / A3176
Firmware/Software Rev4.272 / 3.120
Name: Vista Environmental
Descr1: 1021 Didrikson Way
Descr2: Laguna Beach, CA 92651
Setup/Setup Descr: logging.log / Untitled
Location:
Note1:
Note2:

Current Any Data
Start Time: 23-Feb-2008 11:04:13
Elapsed Time: 00:20:00.4

	A Weight	C Weight	Flat
Leq:	62.2 dBA	65.1 dBC	65.5 dBF
SEL:	93.0 dBA	95.9 dBC	96.3 dBF
Peak:	104.8 dBA	105.3 dBC	105.5 dBF
	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54
Lmax (slow):	87.8 dBA	87.4 dBC	87.5 dBF
	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54
Lmin (slow):	47.1 dBA	56.2 dBC	57.3 dBF
	23-Feb-2008 11:13:48	23-Feb-2008 11:22:59	23-Feb-2008 11:22:59
Lmax (fast):	95.2 dBA	94.8 dBC	94.9 dBF
	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54
Lmin (fast):	41.5 dBA	53.4 dBC	54.5 dBF
	23-Feb-2008 11:11:45	23-Feb-2008 11:24:03	23-Feb-2008 11:24:03
Lmax (impulse):	97.8 dBA	97.5 dBC	97.5 dBF
	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54	23-Feb-2008 11:06:54
Lmin (impulse):	52.2 dBA	59.1 dBC	59.8 dBF
	23-Feb-2008 11:15:08	23-Feb-2008 11:04:13	23-Feb-2008 11:22:59