# The Park at Live Oak

## NOISE IMPACT ANALYSIS

### CITY OF IRWINDALE

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# LIST OF ABBREVIATED TERMS

| | |
|---|---|
| (1) | Reference |
| ADT | Average Daily Traffic |
| ANSI | American National Standards Institute |
| Calveno | California Vehicle Noise |
| CEQA | California Environmental Quality Act |
| CNEL | Community Noise Equivalent Level |
| dBA | A-weighted decibels |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| I-605 | Interstate 605 |
| INCE | Institute of Noise Control Engineering |
| $L_{eq}$ | Equivalent continuous (average) sound level |
| $L_{max}$ | Maximum level measured over the time interval |
| $L_{min}$ | Minimum level measured over the time interval |
| mph | Miles per hour |
| PA | Planning Area |
| PPV | Peak Particle Velocity |
| Project | The Park at Live Oak |
| REMEL | Reference Energy Mean Emission Level |
| RMS | Root-mean-square |
| VdB | Vibration Decibels |

# EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures, if any, for the proposed The Park at Live Oak development ("Project"). The Project site is located west of the Interstate 605 (I-605) freeway between Arrow Highway and Live Oak Avenue in the City of Irwindale. The Project is entitling a Specific Plan for the proposed Project, which identifies allowable uses based on Planning Areas (PAs) including high-cube warehouse, general light industrial, warehousing, manufacturing, restaurant, commercial retail, gas station, and coffee shop uses. This study has been prepared consistent with applicable City of Irwindale noise standards, and significance criteria based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) In addition, since some of the nearby receiver locations are located in the adjacent jurisdictions of the Cities of Duarte, Baldwin Park, El Monte, and Monrovia, appropriate standards and thresholds from each jurisdiction are used in this analysis where applicable.

## OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 24 roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in *The Park at Live Oak Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Opening Year 2020, and Horizon Year 2040 conditions. The analysis shows that the unmitigated Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

Note that the *Traffic Impact Analysis* overstates the Project's commercial square footage by 1,600 square feet. The total amount of commercial square footage studied by the *Traffic Impact Analysis* totals 53,200 square feet in PAs 1A, 2A, and 3A, but the Project Specific Plan proposes only a maximum square footage of 51,600 square feet within PAs 1A, 2A, and 3A. Thus, the trip generation for the Project is overstated, and therefore, the off-site traffic noise levels generated by the Project are overstated as well.

## OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the potential noise sources within The Park at Live Oak site, this analysis estimates the Project-related operational (stationary-source) noise levels at the nearby noise-sensitive receiver locations. The Project-related operational noise sources are expected to include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, refrigerated containers or reefers, roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activity. The analysis shows that the unmitigated Project-related operational noise levels will satisfy the City of

Irwindale and adjacent jurisdictions' exterior noise level standards at the closest noise-sensitive and non-noise sensitive receiver locations in the Project study area. Therefore, operational noise impacts are considered *less than significant*.

While the Project identifies allowable uses for each Planning Area, shown on Exhibit 1-B of this study, the operational noise levels provided herein represent the worst-case operational noise levels assuming each potential Project noise source is located at the closest point on the Project site to each nearby receiver location, to present a conservative approach.

Further, this analysis demonstrates that the Project-related noise level increases to the existing noise environment at all receiver locations would be less than the Federal Interagency Committee on Noise (FICON) guidance for noise level increases, and thus would be *less than significant* during daytime and nighttime hours. Therefore, the operational noise level impacts associated with the proposed Project activities, such as the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, refrigerated containers or reefers, roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activity will be *less than significant*.

## CONSTRUCTION NOISE ANALYSIS

Using sample reference noise levels to represent the construction activities of The Park at Live Oak site, this analysis estimates the Project-related construction noise levels at nearby receiver locations. The Project-related short-term construction noise levels at the nearby sensitive receiver locations are expected to range from 32.4 to 67.9 dBA $L_{eq}$ during on-site Project construction activities and between 29.0 to 59.2 dBA $L_{eq}$ during off-site water line construction activities. The analysis demonstrates that the unmitigated construction noise levels satisfy the City of Irwindale construction noise level threshold of 5 dBA $L_{eq}$ above the ambient noise level at the nearby receiver locations. Therefore, Project construction noise levels are considered a *less than significant* impact.

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

## CONSTRUCTION VIBRATION ANALYSIS

Project construction vibration velocity levels are expected to approach 0.003 in/sec RMS. Since the study area jurisdictions do not identify specific vibration level thresholds this analysis relies on the County of Los Angeles vibration level threshold of 0.01 in/sec RMS. Based on this criteria, the proposed Project construction activities will not exceed the vibration threshold at the nearby sensitive receiver locations during Project construction activities. Therefore, the Project-related vibration impacts will be *less than significant* during the construction activities at the Project site.

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (3) The peak Project-construction vibration levels are shown to approach 0.004 in/sec PPV and will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

## SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

**TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS**

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

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

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# 1 INTRODUCTION

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

## 1.1 SITE LOCATION

The proposed The Park at Live Oak Project is located west of the Interstate 605 (I-605) freeway between Arrow Highway and Live Oak Avenue in the City of Irwindale, as shown on Exhibit 1-A. I-605 is located immediately east of the Project site, and El Monte Airport is located roughly 2.8 miles southwest of the Project site. Existing land uses in the Project study area include quarry and industrial uses north, east, and west of the Project site, and the Irwindale Event Center to the south across Live Oak Avenue. The Project site currently operates as an Inert Debris Engineered Fill Operation (IDEFO) and generates existing noise levels associated with this use under existing conditions.

## 1.2 PROJECT DESCRIPTION

The Project is entitling a Specific Plan for the proposed Project, which identifies allowable uses for each Planning Area (PA). Due to uncertainties in future market conditions, the listed land use assumptions below are intended to be just that – assumptions. For purposes of this noise study, the Project has assumed the following mix of land uses based on the allowable uses and intensities identified in the Specific Plan to conservatively estimate future Project traffic. The *Traffic Impact Analysis* overstates the Project's commercial square footage by 1,600 square feet. The total amount of commercial square footage studied by the *Traffic Impact Analysis* totals 53,200 square feet in PAs 1A, 2A, and 3A, but the Project Specific Plan proposes only a maximum square footage of 51,600 square feet within PAs 1A, 2A, and 3A. Thus, the trip generation for the Project is overstated, and therefore, the off-site traffic noise levels generated by the Project are overstated as well.

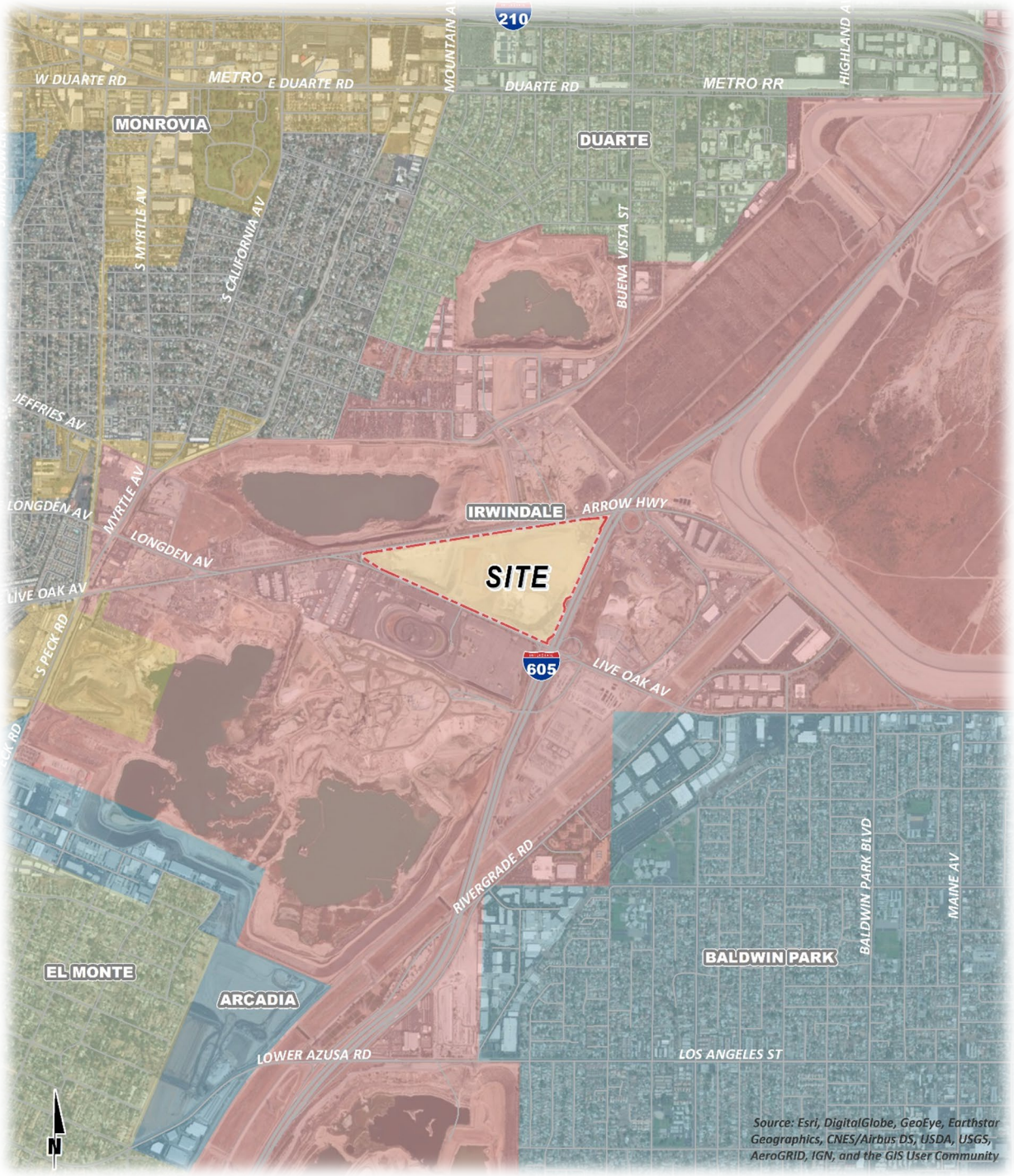
- PA 1: 412,500 square feet High-Cube Fulfillment Center Warehouse
- PA 1: 412,500 square feet of High-Cube Transload and Short-Term Storage Warehouse (Without Cold Storage)
- PA 1A: 8,700 square feet of Fast Food Restaurant with Drive-through Window
- PA 1A: 12,000 square feet of Fast Food Restaurant without Drive-through Window
- PA 1A: 12,000 square feet of Commercial Retail use
- PA 1A: 8 vehicle fueling position Gas Station with Convenience Market

- PA 2: 218,400 square feet of High-Cube Transload and Short-Term Storage Warehouse (Without Cold Storage)
- PA 2: 54,600 square feet of General Light Industrial
- PA 2: 60,000 square feet of Warehousing
- PA 3: 102,000 square feet of Manufacturing
- PA 3: 191,400 square feet of Warehousing
- PA 3A: 3,000 square feet of Coffee-shop with Drive-Through Window
- PA 3A: 7,000 square feet of Fast Food Restaurant without Drive-through Window
- PA 3A: 10,500 square feet of Commercial Retail use
- PA 4: 47,000 square feet of Commercial Retail use

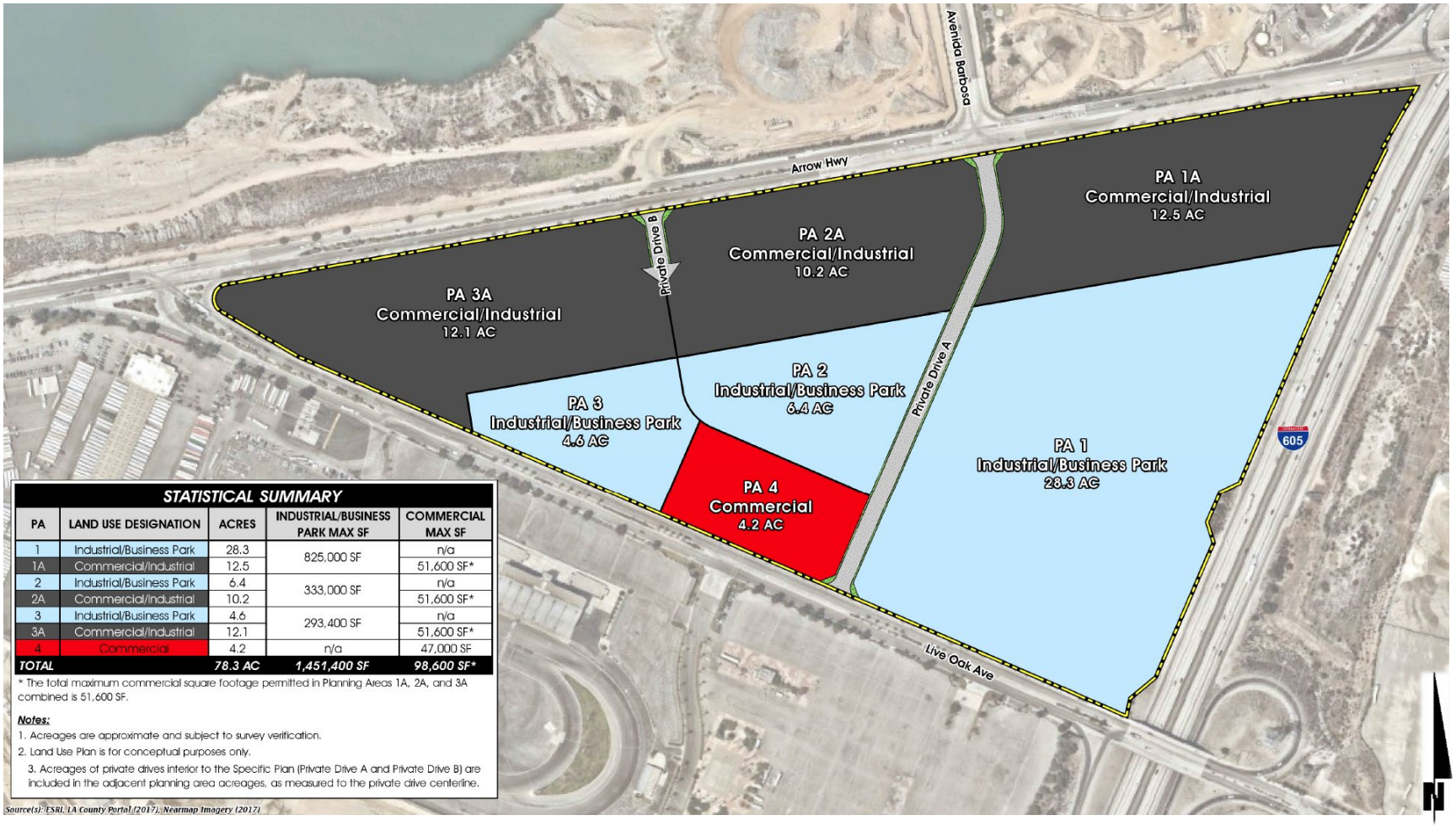
The land use plan showing the various planning areas is shown on Exhibit 1-B. The anticipated Opening Year for the Project is 2020.

Per *The Park at Live Oak Traffic Impact Analysis* prepared by Urban Crossroads, Inc. the Project is expected to generate a net total of approximately 14,607 trip-ends per day (actual vehicles). (2) The Project trip generation includes 808 truck trip-ends per day from the proposed Project site. This noise study relies on the Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network.

## EXHIBIT 1-A: LOCATION MAP



## EXHIBIT 1-B: LAND USE PLAN




**STATISTICAL SUMMARY**

| PA | LAND USE DESIGNATION | ACRES | INDUSTRIAL/BUSINESS PARK MAX SF | COMMERCIAL MAX SF |
|---|---|---|---|---|
| 1 | Industrial/Business Park | 28.3 | 825,000 SF | n/a |
| 1A | Commercial/Industrial | 12.5 | | 51,600 SF* |
| 2 | Industrial/Business Park | 6.4 | 333,000 SF | n/a |
| 2A | Commercial/Industrial | 10.2 | | 51,600 SF* |
| 3 | Industrial/Business Park | 4.6 | 293,400 SF | n/a |
| 3A | Commercial/Industrial | 12.1 | | 51,600 SF* |
| 4 | Commercial | 4.2 | n/a | 47,000 SF |
| *TOTAL* | | *78.3 AC* | *1,451,400 SF* | *98,600 SF** |

* The total maximum commercial square footage permitted in Planning Areas 1A, 2A, and 3A combined is 51,600 SF.

***Notes:***

1. Acreages are approximate and subject to survey verification.
2. Land Use Plan is for conceptual purposes only.
3. Acreages of private drives interior to the Specific Plan (Private Drive A and Private Drive B) are included in the adjacent planning area acreages, as measured to the private drive centerline.

*Source(s): ESRI, LA County Portal (2017), Nearmap Imagery (2017)*

# 2 FUNDAMENTALS

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

**EXHIBIT 2-A: TYPICAL NOISE LEVELS**

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

*Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.*

## 2.1 RANGE OF NOISE

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

at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

## 2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level ($L_{eq}$). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level ($L_{eq}$) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

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

## 2.3 SOUND PROPAGATION

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

### 2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (4)

### 2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (6)

### 2.3.3 ATMOSPHERIC EFFECTS

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (4)

### 2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby resident. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (6)

## 2.4 NOISE CONTROL

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

## 2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

## 2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (7)

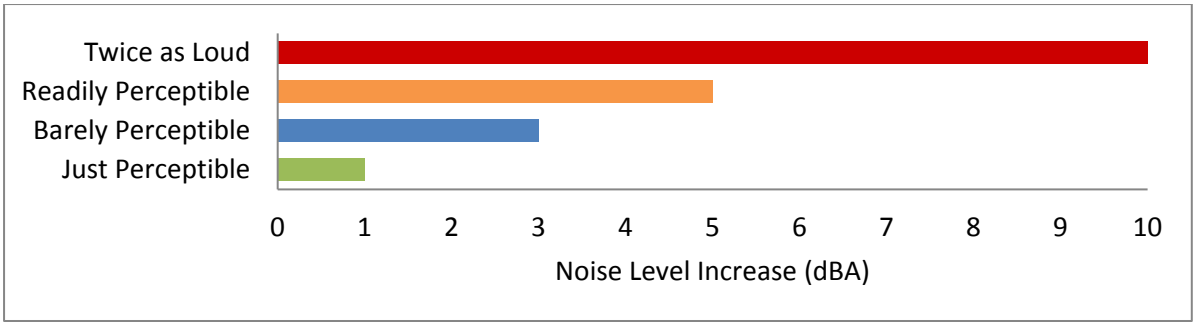
## 2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another 25-percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (8) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (8) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)

**EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION**



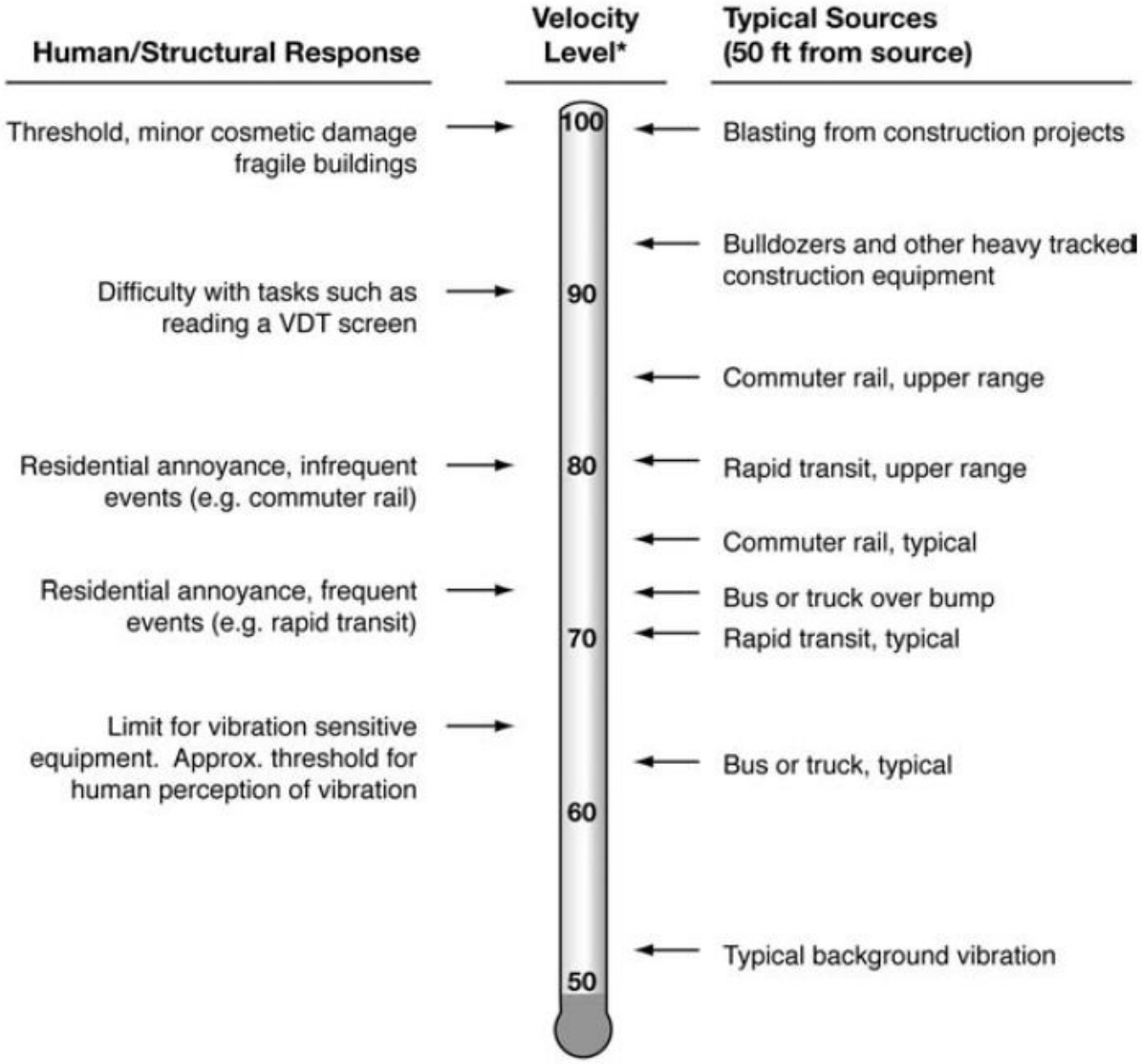

## 2.8 VIBRATION

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

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

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

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




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

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

# 3 REGULATORY SETTING

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

## 3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research. (9) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

## 3.2 STATE OF CALIFORNIA BUILDING STANDARDS

The 2016 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (10) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available, and the noise level exceeds 65 dBA $L_{eq}$ for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

## 3.3 CITY OF IRWINDALE GENERAL PLAN NOISE ELEMENT

The Public Safety Element of the City of Irwindale General Plan identifies noise compatibility criteria consistent with the Governor's Office of Planning and Research (OPR). (11) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

The guidelines included in the General Plan Noise Element consider land use compatibility and identify exterior noise level compatibility criteria for transportation related noise. The *Noise and Land Use Compatibility* criteria provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

Per the City's *Noise and Land Use Compatibility* criteria, noise-sensitive land uses such as residential uses are *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels approaching 70 dBA CNEL. Industrial uses, such as the Project, are *conditionally acceptable* with exterior noise levels between 67 to 78 dBA CNEL and *normally unacceptable* with exterior noise levels above 75 dBA CNEL. For the purposes of this noise study, industrial land uses are considered *normally acceptable* land use with exterior noise levels below 70 dBA CNEL, consistent with the adjacent jurisdictional compatibility criteria of the General Plans for the nearby Cities of Duarte, Baldwin Park, El Monte, and Monrovia.

## 3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as The Park at Live Oak Project, stationary-source (operational) noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, refrigerated containers or reefers, roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activity are typically evaluated against standards established under a City's Municipal Code. Although the Project site is located within the City of Irwindale, nearby receiver locations are also located in the adjacent Cities of Duarte, Baldwin Park, El Monte, and Monrovia. Therefore, to accurately describe the potential operational noise levels, this analysis presents the appropriate operational noise standards for each of the noise-sensitive receivers located within each respective jurisdiction, as shown on Table 3-1.

**TABLE 3-1: OPERATIONAL NOISE STANDARDS**

| Jurisdiction | Land Use | Time Period | Exterior Noise Levels (dBA $L_{eq}$)[6] |
|---|---|---|---|
| City of Irwindale[1] | Residential | Daytime | 50 |
| | | Nighttime | 45 |
| | Commercial | Daytime | 55 |
| | | Nighttime | 50 |
| | Industrial | Daytime | 70 |
| | | Nighttime | 60 |
| City of Duarte[2] | Residential (R-1, R-2) | Daytime | 55 |
| | | Nighttime | 45 |
| | Residential (R-3, R-4) | Daytime | 55 |
| | | Nighttime | 50 |
| City of Baldwin Park[3] | Residential | Day | 55 |
| | | Evening | 50 |
| | | Night | 45 |
| City of El Monte[4] | Residential (Single-Family) | Daytime | 50 |
| | | Nighttime | 45 |
| City of Monrovia[5] | Residential | Daytime | 55 |
| | | Nighttime | 50 |

[1] Source: City of Irwindale Municipal Code, Section 9.28.030 (Appendix 3.1).
[2] Source: City of Duarte Municipal Code, Section 9.68.050.
[3] Source: City of Baldwin Park Municipal Code, Section 153.140.070.
[4] Source: City of El Monte Municipal Code, Section 8.36.040.
[5] Source: City of Monrovia Municipal Code, Section 9.44.040.
[6] $L_{eq}$ represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.
"Daytime" & "Nighttime" Hours by Jurisdiction:
Irwindale, Duarte, & El Monte: "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.;
Baldwin Park: "Day" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Night" = 10:00 p.m. to 7:00 a.m.;
Monrovia: "Daytime" = 7:00 a.m. to 9:00 p.m.; "Nighttime" = 9:00 p.m. to 7:00 a.m.

## 3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of The Park at Live Oak, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below based on those of the City of Irwindale, Duarte, Baldwin Park, El Monte, and Monrovia to determine the potential noise impacts at receivers within each jurisdiction. The construction-related noise standards for each City are summarized in Table 3-2 below.

### 3.5.1 CITY OF IRWINDALE CONSTRUCTION NOISE STANDARDS

The City of Irwindale has set restrictions to control noise impacts associated with the construction of the proposed Project. Municipal Code, Section 9.28.110, indicates that construction activity cannot constitute a violation of Section 9.28.040 unless authorized by a building inspector.

Section 9.28.040 identifies the construction noise level threshold for use in this noise study and indicates that Project construction noise levels shall not exceed the base exterior noise level standard or the ambient noise level, whichever is greater, by more than 5 dBA at the nearby receiver locations. (12)

### 3.5.2 OTHER CITY CONSTRUCTION NOISE STANDARDS

While the Cities of Duarte, Baldwin Park, El Monte, and Monrovia establish limits to the hours during which construction activity may take place within each jurisdiction, neither the Cities' General Plans nor their Municipal Codes establish numeric maximum acceptable construction source noise levels at potentially affected receivers. Therefore, the City of Irwindale construction noise level standards are used in this analysis to assess potential impacts within the adjacent jurisdictions and is also consistent with the Los Angeles Municipal Code construction noise level limits (Section 112.02).

**TABLE 3-2: CONSTRUCTION NOISE STANDARDS**

| Jurisdiction | Permitted Hours of Construction Activity | Construction Noise Level Standards (dBA $L_{eq}$) |
|---|---|---|
| City of Irwindale[1] | 7:00 a.m. to 7:00 p.m. | Base Standard or Ambient Noise Level + 5 dBA |
| City of Duarte | Not Applicable | n/a |
| City of Baldwin Park | Not Applicable | Lowest Allowable Increase of 5 dBA |
| City of El Monte | Not Applicable | n/a |
| Acceptable threshold for determining the relative significance of Project construction noise levels:[2] | | Base Standard or Ambient Noise Level + 5 dBA |

[1] Source: City of Irwindale Municipal Code, Section 9.28.110 (Appendix 3.1).
[2] Construction noise level threshold based on the City of Irwindale Municipal Code standards, consistent with the City of Baldwin Park standards and the Los Angeles Municipal Code construction noise level limits (Section 112.02).
"n/a" = Municipal Code does not identify maximum acceptable construction source noise levels.

## 3.6 VIBRATION STANDARDS

Since the City of Irwindale, Duarte, Baldwin Park, El Monte, and Monrovia General Plans and Municipal Codes do not identify specific vibration level standards, the Los Angeles County Code, Section 12.08.350, vibration perception threshold of 0.01 in/sec RMS is used in this analysis. (13) For the purposes of this analysis, the perception threshold of 0.01 in/sec RMS shall be used to assess the potential impacts due to Project construction at nearby sensitive receiver locations.

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

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# 4 SIGNIFICANCE CRITERIA

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

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

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

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

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

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

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

While the CEQA Guidelines and the City of Irwindale General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The Project site is not within two miles of a public airport or located near a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guidelines E and F.

## 4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (14) Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL), energy average noise level ($L_{eq}$), and median noise level ($L_{50}$).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

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

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

Federal Interagency Committee on Noise (FICON), 1992.

## 4.2 NON-NOISE-SENSITIVE RECEIVERS

Non-noise-sensitive industrial uses, such as the Project, are considered *conditionally acceptable* with exterior noise levels between 67 to 78 dBA CNEL and *normally unacceptable* with exterior noise levels above 75 dBA CNEL. For the purposes of this noise study, industrial land uses are considered *normally acceptable* land use with exterior noise levels below 70 dBA CNEL, consistent with the adjacent jurisdictional compatibility criteria of the General Plans for the nearby Cities of Duarte, Baldwin Park, El Monte, and Monrovia.

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are

greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Irwindale General Plan *Noise and Land Use Compatibility* criteria.

## 4.3 SIGNIFICANCE CRITERIA SUMMARY

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

**OFF-SITE TRAFFIC NOISE**

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
    - are less than the City of Irwindale General Plan *Noise and Land Use Compatibility* 70 dBA CNEL criteria and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - are greater than the City of Irwindale General Plan *Noise and Land Use Compatibility* 70 dBA CNEL criteria and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

**OPERATIONAL NOISE**

- If Project-related operational (stationary-source) noise levels exceed the exterior noise level limits at receiver locations within the jurisdiction of the City of Irwindale, Duarte, Baldwin Park, El Monte, or Monrovia (as listed on Table 3-1).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA $L_{eq}$ and the Project creates a *readily perceptible* 5 dBA $L_{eq}$ or greater Project-related noise level increase; or
    - range from 60 to 65 dBA $L_{eq}$ and the Project creates a *barely perceptible* 3 dBA $L_{eq}$ or greater Project-related noise level increase; or
    - already exceed 65 dBA $L_{eq}$, and the Project creates a community noise level impact of greater than 1.5 dBA $L_{eq}$ (FICON, 1992).
- If long-term Project-generated operational vibration levels could exceed the Los Angeles County acceptable vibration threshold of 0.01 in/sec RMS at sensitive receiver locations (Los Angeles County Code, Section 12.08.350).

**CONSTRUCTION NOISE AND VIBRATION**

- If Project-related construction activities create noise levels at nearby receiver locations exceeding the ambient noise level plus 5 dBA $L_{eq}$ (City of Irwindale Municipal Code, Section 9.28.110 (Appendix 3.1). The construction noise level threshold is based on the City of Irwindale Municipal Code standards, consistent with the City of Baldwin Park standards and the Los Angeles Municipal Code construction noise level limits (Section 112.02)).
- If short-term Project-generated construction source vibration levels could exceed the Los Angeles County acceptable vibration standard of 0.01 in/sec RMS at sensitive receiver locations (Los Angeles County Code, Section 12.08.350).

**TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY**

| Analysis | Receiving Land Use | Jurisdiction | Condition(s) | Significance Criteria | |
|---|---|---|---|---|---|
| | | | | Daytime | Nighttime |
| Off-Site Traffic | Noise-Sensitive[1] | All | If ambient is < 60 dBA CNEL | ≥ 5 dBA CNEL Project increase | |
| | | | If ambient is 60 - 65 dBA CNEL | ≥ 3 dBA CNEL Project increase | |
| | | | If ambient is > 65 dBA CNEL | ≥ 1.5 dBA CNEL Project increase | |
| | Non-Noise-Sensitive[2] | | if ambient is < 70 dBA CNEL | ≥ 5 dBA CNEL Project increase | |
| | | | if ambient is > 70 dBA CNEL | ≥ 3 dBA CNEL Project increase | |
| Operational | Any | All | Exterior Noise Level Limits | See Table 3-1. | |
| | Noise-Sensitive | All[1] | if ambient is < 60 dBA $L_{eq}$ | ≥ 5 dBA $L_{eq}$ Project increase | |
| | | | if ambient is 60 - 65 dBA $L_{eq}$ | ≥ 3 dBA $L_{eq}$ Project increase | |
| | | | if ambient is > 65 dBA $L_{eq}$ | ≥ 1.5 dBA $L_{eq}$ Project increase | |
| | Any | All | Vibration Level Threshold[3] | 0.01 in/sec RMS | |
| Construction | Any | All | Noise Level Threshold[4] | Ambient + 5 dBA $L_{eq}$ | |
| | | | Vibration Level Threshold[3] | 0.01 in/sec RMS | |

[1] Source: FICON, 1992.
[2] Based on the City of Irwindale General Plan, Noise and Land Use Compatibility criteria (Page 146) and consistent with adjacent criteria of the Cities of Duarte, Baldwin Park, and El Monte criteria.
[3] Source: Los Angeles County Code, Section 12.08.350.
[4] Source: City of Irwindale Municipal Code, Section 9.28.110 (Appendix 3.1). The construction noise level threshold is based on the City of Irwindale Municipal Code standards, consistent with the City of Baldwin Park standards and the Los Angeles Municipal Code construction noise level limits (Section 112.02).
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "RMS" = root-mean-square

# 5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, eight individual 24-hour noise level measurements were taken at receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, August 24th, 2017 at the closest sensitive receiver locations and non-noise-sensitive receiver locations. Appendix 5.1 includes study area photos.

## 5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

## 5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent any part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources.* (4) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (3)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (3) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the

future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

## 5.3 NOISE MEASUREMENT RESULTS

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

- Location L1 represents the noise levels on Longden Avenue west of the Project adjacent to Longden Avenue Park, Plymouth Elementary School, and existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 70.5 dBA CNEL. The hourly noise levels measured at location L1 ranged from 63.0 to 69.4 dBA $L_{eq}$ during the daytime hours and from 51.0 to 69.6 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.3 dBA $L_{eq}$ with an average nighttime noise level of 63.3 dBA $L_{eq}$.
- Location L2 represents the noise levels north of the Project site on Meridian Street near existing residential homes and industrial uses. The noise level measurements collected show an overall 24-hour exterior noise level of 70.6 dBA CNEL. The hourly noise levels measured at location L2 ranged from 61.8 to 70.4 dBA $L_{eq}$ during the daytime hours and from 52.4 to 66.4 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 67.2 dBA $L_{eq}$ with an average nighttime noise level of 62.9 dBA $L_{eq}$.
    - This location was chosen based on conditions in the field to represent the residential uses north of the Project site. Due to the long-term nature of the measurements (a minimum 24 hours), a secure location was selected at a greater distance from the Project site than that of residential homes located at closer distances (e.g., homes on Van Meter Street). Further, all measurement locations were selected consistent with the FTA and Caltrans guidance previously described in Section 5.2 above.
- Location L3 represents the noise levels north of the Project site on Kellwill Way near existing residential homes and Beardslee Elementary School. The 24-hour CNEL indicates that the overall exterior noise level is 58.6 dBA CNEL. At location L3 the background ambient noise levels ranged from 49.3 to 57.6 dBA $L_{eq}$ during the daytime hours to levels of 44.9 to 56.0 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 55.3 dBA $L_{eq}$ with an average nighttime noise level of 51.0 dBA $L_{eq}$.
- Location L4 represents the noise levels in the Santa Fe Dam Recreation Area east of the Project site. The noise level measurements collected show an overall 24-hour exterior noise level of 52.6 dBA CNEL. The hourly noise levels measured at location L4 ranged from 43.9 to 58.6 dBA $L_{eq}$ during the daytime hours and from 37.4 to 47.9 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 51.8 dBA $L_{eq}$ with an average nighttime noise level of 43.0 dBA $L_{eq}$.

- Location L5 represents the noise levels southeast of the Project adjacent to existing industrial uses on Live Oak Avenue and nearby residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 60.5 dBA CNEL. The hourly noise levels measured at location L5 ranged from 52.0 to 58.9 dBA $L_{eq}$ during the daytime hours and from 49.4 to 58.4 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 56.1 dBA $L_{eq}$ with an average nighttime noise level of 53.3 dBA $L_{eq}$.
- Location L6 represents the noise levels south of the Project site near Walnut Elementary School, existing residential homes, and Olive Middle School. The noise level measurements collected show an overall 24-hour exterior noise level of 61.6 dBA CNEL. The hourly noise levels measured at location L6 ranged from 52.6 to 59.6 dBA $L_{eq}$ during the daytime hours and from 50.7 to 58.0 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 56.3 dBA $L_{eq}$ with an average nighttime noise level of 54.7 dBA $L_{eq}$.
- Location L7 represents the noise levels southwest of the Project site near existing residential homes on Durfee Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 57.0 dBA CNEL. The hourly noise levels measured at location L7 ranged from 49.6 to 55.5 dBA $L_{eq}$ during the daytime hours and from 40.7 to 53.7 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 53.2 dBA $L_{eq}$ with an average nighttime noise level of 49.5 dBA $L_{eq}$.
- Location L8 represents the noise levels south of the Project site on Live Oak Avenue near the Irwindale Event Center and existing industrial uses. The noise level measurements collected show an overall 24-hour exterior noise level of 83.8 dBA CNEL. The hourly noise levels measured at location L8 ranged from 75.7 to 82.3 dBA $L_{eq}$ during the daytime hours and from 71.3 to 80.0 dBA $L_{eq}$ during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 80.1 dBA $L_{eq}$ with an average nighttime noise level of 76.4 dBA $L_{eq}$.

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

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network and stationary-source noise associated with existing quarry and industrial uses. Further, the Project site currently operates as an Inert Debris Engineered Fill Operation (IDEFO) and generates existing noise levels associated with this use under existing conditions. The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.

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

| Location[1] | Distance to Project Boundary (Feet) | Description | Energy Average Noise Level (dBA $L_{eq}$)[2] | | CNEL |
|---|---|---|---|---|---|
| | | | Daytime | Nighttime | |
| L1 | 4,900' | Located on Longden Avenue west of the Project adjacent to Longden Avenue Park, Plymouth Elementary School, and existing residential homes. | 66.3 | 63.3 | 70.5 |
| L2 | 2,800' | Located north of the Project site on Meridian Street near existing residential homes and industrial uses. | 67.2 | 62.9 | 70.6 |
| L3 | 5,125' | Located north of the Project site on Kellwill Way near existing residential homes and Beardslee Elementary School. | 55.3 | 51.0 | 58.6 |
| L4 | 6,330' | Located in the Santa Fe Dam Recreation Area east of the Project site. | 51.8 | 43.0 | 52.6 |
| L5 | 5,000' | Located southeast of the Project adjacent to existing industrial uses on Live Oak Avenue and nearby residential homes. | 56.1 | 53.3 | 60.5 |
| L6 | 4,230' | Located south of the Project site near Walnut Elementary School, existing residential homes, and Olive Middle School. | 56.3 | 54.7 | 61.6 |
| L7 | 5,575' | Located southwest of the Project site near existing residential homes on Durfee Avenue. | 53.2 | 49.5 | 57.0 |
| L8 | 60' | Located south of the Project site on Live Oak Avenue near the Irwindale Event Center and existing industrial uses. | 80.1 | 76.4 | 83.8 |

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

## EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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# 6 METHODS AND PROCEDURES

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

## 6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (17) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (18) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

## 6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 24 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Irwindale, Duarte, Baldwin Park, El Monte, and Monrovia General Plan Circulation Elements, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-2 are based on *The Park at Live Oak Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Opening Year 2020, Horizon Year 2040. (2) For this analysis, soft site conditions are used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Caltrans' research has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model as used in this off-site traffic noise analysis. (19)

Per *The Park at Live Oak Traffic Impact Analysis* prepared by Urban Crossroads, Inc. the Project is expected to generate a net total of approximately 14,607 trip-ends per day (actual vehicles). (2) The Project trip generation includes 808 truck trip-ends per day from the proposed Project site. This noise study relies on the Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project-related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project-related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. The 808 daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

**TABLE 6-1: OFF-SITE ROADWAY PARAMETERS**

| ID | Roadway | Segment | Adjacent Planned (Existing) Land Use[1] | Distance from Centerline to Nearest Adjacent Land Use (Feet)[2] | Posted Vehicle Speed (mph) |
|---|---|---|---|---|---|
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 30' | 40 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 60' | 40 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 30' | 40 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 30' | 40 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 30' | 40 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 30' | 40 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 30' | 50 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 40' | 30 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 50' | 40 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 40' | 35 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 30' | 40 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 30' | 40 |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 48' | 40 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 40' | 45 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 40' | 45 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 40' | 45 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 40' | 45 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 40' | 45 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 40' | 45 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 40' | 45 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 50' | 45 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 50' | 45 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 50' | 45 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 50' | 45 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Elements.

**TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES**

| ID | Roadway Segment | Average Daily Traffic Volumes[1] | | | | | |
|---|---|---|---|---|---|---|---|
| | | Existing | | Opening Year Cumulative 2020 | | Horizon Year 2040 Without | |
| | | Without Project | With Project | Without Project | With Project | Without Project | With Project |
| 1 | Myrtle Av. n/o Longden Av. | 25,837 | 26,527 | 27,774 | 28,464 | 29,493 | 30,183 |
| 2 | Peck Rd. s/o Arrow Hwy. | 21,475 | 22,165 | 23,235 | 23,925 | 23,383 | 24,073 |
| 3 | Avenida Barbosa n/o Buena Vista St. | 6,136 | 6,826 | 6,857 | 7,547 | 7,265 | 7,955 |
| 4 | Avenida Barbosa s/o Buena Vista St. | 15,611 | 16,301 | 17,446 | 18,136 | 18,485 | 19,175 |
| 5 | Rivergrade Rd. s/o Arrow Hwy. | 5,363 | 8,399 | 8,112 | 11,148 | 8,469 | 11,505 |
| 6 | Rivergrade Rd. s/o Stewart Av. | 2,535 | 5,571 | 2,690 | 5,726 | 2,859 | 5,895 |
| 7 | Rivergrade Rd. s/o Live Oak Av. | 11,042 | 11,594 | 14,673 | 15,225 | 15,407 | 15,959 |
| 8 | Stewart Av. s/o Live Oak Av. | 5,755 | 6,445 | 6,771 | 7,461 | 7,154 | 7,844 |
| 9 | Baldwin Park Bl. s/o Live Oak Av. | 11,684 | 12,374 | 13,419 | 14,109 | 14,196 | 14,886 |
| 10 | Maine Av. s/o Arrow Hwy. | 10,106 | 10,796 | 11,725 | 12,415 | 12,397 | 13,087 |
| 11 | Longden Av. w/o Myrtle Av. | 13,381 | 14,071 | 14,556 | 15,246 | 15,446 | 16,136 |
| 12 | Longden Av. e/o Myrtle Av. | 16,851 | 18,231 | 18,595 | 19,975 | 19,716 | 21,096 |
| 13 | Live Oak Av. w/o Peck Rd. | 25,108 | 25,822 | 27,883 | 28,597 | 29,553 | 30,267 |
| 14 | Arrow Hwy. e/o Peck Rd. | 23,789 | 25,193 | 26,917 | 28,321 | 28,500 | 29,904 |
| 15 | Arrow Hwy. e/o Longden Av. | 41,218 | 44,002 | 46,253 | 49,037 | 48,995 | 51,779 |
| 16 | Arrow Hwy. e/o I-605 Fwy. | 27,508 | 31,924 | 31,969 | 36,385 | 33,799 | 38,215 |
| 17 | Arrow Hwy. w/o Rivergrade Rd. | 24,194 | 28,610 | 26,801 | 31,217 | 28,411 | 32,827 |
| 18 | Arrow Hwy. e/o Rivergrade Rd. | 21,137 | 22,517 | 25,978 | 27,358 | 27,384 | 28,764 |
| 19 | Arrow Hwy. w/o Maine Av. | 44,296 | 45,676 | 50,172 | 51,552 | 53,119 | 54,499 |
| 20 | Arrow Hwy. e/o Maine Av. | 32,875 | 33,719 | 37,273 | 38,117 | 39,460 | 40,304 |
| 21 | Live Oak Av. w/o Rivergrade Rd. | 27,508 | 29,456 | 31,971 | 33,919 | 33,801 | 35,749 |
| 22 | Live Oak Av. e/o Rivergrade Rd. | 30,406 | 31,802 | 34,512 | 35,908 | 36,535 | 37,931 |
| 23 | Live Oak Av. e/o Stewart Av. | 29,466 | 30,172 | 33,071 | 33,777 | 35,031 | 35,737 |
| 24 | Live Oak Av. w/o Arrow Hwy. | 25,119 | 25,825 | 29,041 | 29,747 | 30,712 | 31,418 |

[1] Source: The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.

**TABLE 6-3: TIME OF DAY VEHICLE SPLITS**

| Vehicle Type | Time of Day Splits[1] | | | Total of Time of Day Splits |
|---|---|---|---|---|
| | Daytime | Evening | Nighttime | |
| Autos | 72.45% | 9.15% | 18.40% | 100.00% |
| Medium Trucks | 77.70% | 4.78% | 17.52% | 100.00% |
| Heavy Trucks | 84.32% | 2.68% | 13.00% | 100.00% |

[1] Based on existing 24-hour classification counts by vehicle type taken on 11/28/2017 at Arrow Highway west of Maine Avenue (The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018). Vehicle mix percentage values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

**TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX**

| Classification | Total % Traffic Flow[1] | | | Total |
|---|---|---|---|---|
| | Autos | Medium Trucks | Heavy Trucks | |
| All Segments | 85.65% | 9.12% | 5.23% | 100.00% |

[1] Based on existing 24-hour classification counts by vehicle type taken on 11/28/2017 at Arrow Highway west of Maine Avenue (The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018). Vehicle mix percentage values rounded to the nearest one-hundredth.

**TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX**

| ID | Roadway | Segment | With Project[1] | | | |
|---|---|---|---|---|---|---|
| | | | Autos | Medium Trucks | Heavy Trucks | Total[2] |
| 1 | Myrtle Av. | n/o Longden Av. | 86.02% | 8.89% | 5.09% | 100.00% |
| 2 | Peck Rd. | s/o Arrow Hwy. | 86.10% | 8.84% | 5.06% | 100.00% |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 87.10% | 8.20% | 4.70% | 100.00% |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 86.26% | 8.74% | 5.00% | 100.00% |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 90.84% | 5.83% | 3.34% | 100.00% |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 93.47% | 4.15% | 2.38% | 100.00% |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 86.33% | 8.69% | 4.98% | 100.00% |
| 8 | Stewart Av. | s/o Live Oak Av. | 87.19% | 8.15% | 4.67% | 100.00% |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 86.45% | 8.61% | 4.93% | 100.00% |
| 10 | Maine Av. | s/o Arrow Hwy. | 86.57% | 8.54% | 4.89% | 100.00% |
| 11 | Longden Av. | w/o Myrtle Av. | 86.35% | 8.68% | 4.97% | 100.00% |
| 12 | Longden Av. | e/o Myrtle Av. | 86.74% | 8.43% | 4.83% | 100.00% |
| 13 | Live Oak Av. | w/o Peck Rd. | 85.95% | 8.89% | 5.16% | 100.00% |
| 14 | Arrow Hwy. | e/o Peck Rd. | 86.36% | 8.63% | 5.01% | 100.00% |
| 15 | Arrow Hwy. | e/o Longden Av. | 86.50% | 8.55% | 4.94% | 100.00% |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 87.64% | 7.86% | 4.50% | 100.00% |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 87.87% | 7.71% | 4.42% | 100.00% |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 86.53% | 8.56% | 4.91% | 100.00% |
| 19 | Arrow Hwy. | w/o Maine Av. | 86.08% | 8.85% | 5.07% | 100.00% |
| 20 | Arrow Hwy. | e/o Maine Av. | 85.96% | 8.90% | 5.13% | 100.00% |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 86.55% | 8.53% | 4.92% | 100.00% |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 86.23% | 8.73% | 5.04% | 100.00% |
| 23 | Live Oak Av. | e/o Stewart Av. | 85.93% | 8.92% | 5.15% | 100.00% |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 85.98% | 8.89% | 5.13% | 100.00% |

[1] Source: The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

**TABLE 6-6: OPENING YEAR 2020 WITH PROJECT CONDITIONS VEHICLE MIX**

| ID | Roadway | Segment | With Project[1] | | | |
|---|---|---|---|---|---|---|
| | | | Autos | Medium Trucks | Heavy Trucks | Total[2] |
| 1 | Myrtle Av. | n/o Longden Av. | 86.00% | 8.90% | 5.10% | 100.00% |
| 2 | Peck Rd. | s/o Arrow Hwy. | 86.06% | 8.86% | 5.08% | 100.00% |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 86.96% | 8.29% | 4.75% | 100.00% |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 86.20% | 8.78% | 5.03% | 100.00% |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 89.56% | 6.64% | 3.80% | 100.00% |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 93.26% | 4.29% | 2.46% | 100.00% |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 86.17% | 8.79% | 5.04% | 100.00% |
| 8 | Stewart Av. | s/o Live Oak Av. | 86.98% | 8.28% | 4.74% | 100.00% |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 86.35% | 8.68% | 4.97% | 100.00% |
| 10 | Maine Av. | s/o Arrow Hwy. | 86.45% | 8.62% | 4.94% | 100.00% |
| 11 | Longden Av. | w/o Myrtle Av. | 86.30% | 8.71% | 4.99% | 100.00% |
| 12 | Longden Av. | e/o Myrtle Av. | 86.64% | 8.49% | 4.86% | 100.00% |
| 13 | Live Oak Av. | w/o Peck Rd. | 85.93% | 8.91% | 5.17% | 100.00% |
| 14 | Arrow Hwy. | e/o Peck Rd. | 86.28% | 8.68% | 5.04% | 100.00% |
| 15 | Arrow Hwy. | e/o Longden Av. | 86.42% | 8.61% | 4.97% | 100.00% |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 87.39% | 8.02% | 4.59% | 100.00% |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 87.68% | 7.83% | 4.49% | 100.00% |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 86.37% | 8.66% | 4.96% | 100.00% |
| 19 | Arrow Hwy. | w/o Maine Av. | 86.04% | 8.88% | 5.09% | 100.00% |
| 20 | Arrow Hwy. | e/o Maine Av. | 85.93% | 8.93% | 5.14% | 100.00% |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 86.43% | 8.61% | 4.96% | 100.00% |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 86.16% | 8.78% | 5.06% | 100.00% |
| 23 | Live Oak Av. | e/o Stewart Av. | 85.90% | 8.94% | 5.16% | 100.00% |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 85.94% | 8.92% | 5.15% | 100.00% |

[1] Source: The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

**TABLE 6-7: HORIZON YEAR 2040 WITH PROJECT VEHICLE MIX**

| ID | Roadway | Segment | With Project[1] | | | |
|---|---|---|---|---|---|---|
| | | | Autos | Medium Trucks | Heavy Trucks | Total[2] |
| 1 | Myrtle Av. | n/o Longden Av. | 85.98% | 8.91% | 5.11% | 100.00% |
| 2 | Peck Rd. | s/o Arrow Hwy. | 86.06% | 8.86% | 5.08% | 100.00% |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 86.90% | 8.33% | 4.77% | 100.00% |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 86.17% | 8.79% | 5.04% | 100.00% |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 89.44% | 6.72% | 3.85% | 100.00% |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 93.04% | 4.42% | 2.53% | 100.00% |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 86.15% | 8.81% | 5.05% | 100.00% |
| 8 | Stewart Av. | s/o Live Oak Av. | 86.91% | 8.32% | 4.77% | 100.00% |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 86.32% | 8.70% | 4.98% | 100.00% |
| 10 | Maine Av. | s/o Arrow Hwy. | 86.41% | 8.64% | 4.95% | 100.00% |
| 11 | Longden Av. | w/o Myrtle Av. | 86.26% | 8.73% | 5.00% | 100.00% |
| 12 | Longden Av. | e/o Myrtle Av. | 86.59% | 8.53% | 4.88% | 100.00% |
| 13 | Live Oak Av. | w/o Peck Rd. | 85.91% | 8.92% | 5.17% | 100.00% |
| 14 | Arrow Hwy. | e/o Peck Rd. | 86.24% | 8.71% | 5.05% | 100.00% |
| 15 | Arrow Hwy. | e/o Longden Av. | 86.38% | 8.64% | 4.98% | 100.00% |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 87.31% | 8.07% | 4.62% | 100.00% |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 87.58% | 7.90% | 4.52% | 100.00% |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 86.34% | 8.69% | 4.98% | 100.00% |
| 19 | Arrow Hwy. | w/o Maine Av. | 86.01% | 8.89% | 5.09% | 100.00% |
| 20 | Arrow Hwy. | e/o Maine Av. | 85.91% | 8.94% | 5.15% | 100.00% |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 86.39% | 8.63% | 4.98% | 100.00% |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 86.14% | 8.80% | 5.07% | 100.00% |
| 23 | Live Oak Av. | e/o Stewart Av. | 85.89% | 8.95% | 5.16% | 100.00% |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 85.92% | 8.93% | 5.15% | 100.00% |

[1] Source: The Park at Live Oak Traffic Impact Analysis, Urban Crossroads, Inc., May 2018.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

## 6.3 CONSTRUCTION VIBRATION ASSESSMENT METHODOLOGY

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

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

**TABLE 6-8: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT**

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

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

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# 7 OFF-SITE TRANSPORTATION NOISE IMPACTS

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

- Existing Conditions Without / With Project: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- Opening Year 2020 Without / With the Project: This scenario refers to Opening Year noise conditions without and with the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.
- Horizon Year 2040 Without / With Project Avenue Extension: This scenario below refers to the background noise conditions at future Year 2040 without and with the proposed Project plus ambient growth. This scenario corresponds to Year 2040 conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

## 7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 24 study area roadway segments analyzed from the without Project to the with Project conditions under Existing, Opening Year 2020, Horizon Year 2040 traffic conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

**TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.0 | 102 | 220 | 473 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.4 | 100 | 216 | 466 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 71.7 | 39 | 84 | 182 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 75.8 | 73 | 157 | 338 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 71.1 | 36 | 77 | 166 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 67.9 | RW | 47 | 101 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 76.3 | 79 | 170 | 366 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 67.0 | RW | 55 | 118 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 71.9 | 67 | 145 | 313 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 70.8 | 45 | 98 | 210 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.1 | 66 | 142 | 305 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.1 | n/a | n/a | n/a |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 75.6 | 114 | 245 | 527 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 78.1 | 139 | 300 | 646 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 80.5 | 201 | 432 | 932 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 78.8 | 153 | 330 | 711 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 78.2 | 141 | 303 | 653 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 77.6 | 129 | 277 | 597 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 80.8 | 211 | 454 | 977 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 79.5 | 173 | 372 | 801 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 79.2 | 204 | 440 | 948 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 79.6 | 218 | 470 | 1013 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 79.5 | 214 | 461 | 992 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 78.8 | 192 | 414 | 892 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

**TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.0 | 102 | 221 | 476 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.4 | 101 | 217 | 469 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 71.9 | 40 | 86 | 185 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 75.8 | 73 | 158 | 341 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 71.7 | 39 | 84 | 182 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 69.1 | RW | 56 | 121 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 76.4 | 80 | 172 | 370 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 67.2 | RW | 56 | 120 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 72.0 | 68 | 147 | 316 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 70.9 | 46 | 99 | 213 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.2 | 66 | 143 | 308 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.2 | n/a | n/a | n/a |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 75.7 | 115 | 247 | 533 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 78.2 | 141 | 305 | 656 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 80.6 | 204 | 439 | 946 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 78.9 | 158 | 340 | 733 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 78.4 | 146 | 314 | 676 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 77.7 | 130 | 280 | 604 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 80.9 | 212 | 456 | 983 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 79.6 | 174 | 375 | 807 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 79.3 | 208 | 447 | 963 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 79.7 | 221 | 476 | 1025 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 79.5 | 215 | 464 | 999 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 78.8 | 194 | 418 | 900 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

**TABLE 7-3: OPENING YEAR 2020 WITHOUT PROJECT CONDITIONS NOISE CONTOURS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.3 | 107 | 231 | 497 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.7 | 106 | 228 | 491 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 72.2 | 42 | 91 | 196 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 76.3 | 79 | 169 | 364 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 72.9 | 47 | 102 | 219 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 68.1 | RW | 49 | 105 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 77.5 | 95 | 205 | 442 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 67.8 | RW | 61 | 132 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 72.5 | 74 | 159 | 343 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 71.5 | 50 | 108 | 232 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.5 | 70 | 150 | 323 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.5 | n/a | n/a | n/a |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 76.1 | 122 | 263 | 566 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 78.7 | 151 | 325 | 701 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 81.0 | 217 | 467 | 1006 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 79.4 | 169 | 365 | 786 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 78.6 | 151 | 325 | 699 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 78.5 | 148 | 318 | 685 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 81.4 | 229 | 493 | 1062 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 80.1 | 188 | 404 | 871 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 79.8 | 226 | 486 | 1048 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 80.2 | 238 | 512 | 1103 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 80.0 | 231 | 497 | 1072 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 79.4 | 212 | 456 | 983 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

**TABLE 7-4: OPENING YEAR 2020 WITH PROJECT CONDITIONS NOISE CONTOURS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.3 | 108 | 232 | 499 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.7 | 106 | 229 | 494 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 72.3 | 43 | 92 | 199 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 76.3 | 79 | 170 | 367 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 73.3 | 50 | 108 | 233 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 69.3 | RW | 58 | 124 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 77.6 | 96 | 207 | 446 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 67.8 | RW | 62 | 133 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 72.6 | 75 | 161 | 346 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 71.5 | 50 | 109 | 234 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.5 | 70 | 151 | 326 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.6 | n/a | n/a | n/a |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 76.1 | 123 | 265 | 571 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 78.7 | 153 | 330 | 711 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 81.1 | 220 | 473 | 1020 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 79.6 | 174 | 375 | 807 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 78.8 | 155 | 335 | 721 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 78.6 | 149 | 321 | 692 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 81.4 | 230 | 496 | 1068 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 80.1 | 189 | 407 | 877 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 79.9 | 229 | 493 | 1062 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 80.2 | 240 | 517 | 1113 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 80.0 | 232 | 501 | 1078 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 79.4 | 213 | 459 | 990 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

**TABLE 7-5: HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.5 | 111 | 240 | 517 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.7 | 106 | 229 | 493 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 72.5 | 44 | 94 | 203 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 76.5 | 82 | 176 | 379 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 73.1 | 48 | 104 | 225 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 68.4 | RW | 51 | 109 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 77.7 | 98 | 212 | 457 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 68.0 | RW | 63 | 136 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 72.8 | 77 | 165 | 356 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 71.7 | 52 | 112 | 241 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.7 | 72 | 156 | 336 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.8 | 85 | 184 | 395 |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 76.3 | 127 | 273 | 588 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 78.9 | 157 | 338 | 728 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 81.3 | 225 | 485 | 1045 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 79.6 | 176 | 379 | 816 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 78.9 | 157 | 337 | 727 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 78.7 | 153 | 329 | 709 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 81.6 | 238 | 512 | 1103 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 80.3 | 195 | 420 | 905 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 80.1 | 234 | 505 | 1087 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 80.4 | 247 | 532 | 1145 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 80.2 | 240 | 517 | 1114 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 79.6 | 220 | 473 | 1020 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

**TABLE 7-6: HORIZON YEAR 2040 WITH PROJECT CONDITIONS**

| ID | Road | Segment | Adjacent Planned (Existing) Land Use[1] | CNEL at Nearest Adjacent Land Use (dBA)[2] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Myrtle Av. | n/o Longden Av. | Industrial | 78.6 | 112 | 241 | 519 |
| 2 | Peck Rd. | s/o Arrow Hwy. | Industrial | 73.8 | 107 | 230 | 496 |
| 3 | Avenida Barbosa | n/o Buena Vista St. | Quarry (Industrial) | 72.6 | 44 | 96 | 207 |
| 4 | Avenida Barbosa | s/o Buena Vista St. | Quarry | 76.6 | 82 | 177 | 381 |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | Industrial | 73.5 | 51 | 111 | 239 |
| 6 | Rivergrade Rd. | s/o Stewart Av. | Industrial | 69.5 | RW | 60 | 128 |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | Open Space/Industrial | 77.8 | 99 | 214 | 460 |
| 8 | Stewart Av. | s/o Live Oak Av. | Industrial/Residential | 68.1 | RW | 64 | 138 |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | Industrial/Residential | 72.8 | 77 | 167 | 359 |
| 10 | Maine Av. | s/o Arrow Hwy. | Industrial/Residential | 71.8 | 52 | 113 | 243 |
| 11 | Longden Av. | w/o Myrtle Av. | Industrial (Residential) | 75.8 | 73 | 157 | 339 |
| 12 | Longden Av. | e/o Myrtle Av. | Quarry/Industrial | 76.9 | 86 | 186 | 400 |
| 13 | Live Oak Av. | w/o Peck Rd. | Industrial (Residential) | 76.4 | 128 | 275 | 593 |
| 14 | Arrow Hwy. | e/o Peck Rd. | Industrial | 79.0 | 159 | 343 | 738 |
| 15 | Arrow Hwy. | e/o Longden Av. | Quarry (Industrial) | 81.3 | 228 | 492 | 1059 |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | Open Space/Commercial | 79.8 | 180 | 388 | 836 |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | Open Space/Industrial | 79.1 | 161 | 347 | 748 |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | Open Space/Industrial | 78.8 | 154 | 332 | 716 |
| 19 | Arrow Hwy. | w/o Maine Av. | Open Space/Industrial | 81.6 | 239 | 515 | 1109 |
| 20 | Arrow Hwy. | e/o Maine Av. | Open Space/Industrial | 80.4 | 196 | 423 | 910 |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | Open Space/Industrial | 80.1 | 237 | 511 | 1102 |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | Industrial/Commercial | 80.5 | 249 | 537 | 1156 |
| 23 | Live Oak Av. | e/o Stewart Av. | Industrial (Vacant) | 80.3 | 241 | 520 | 1120 |
| 24 | Live Oak Av. | w/o Arrow Hwy. | Industrial (Vacant) | 79.7 | 221 | 477 | 1027 |

[1] City of Irwindale General Plan Exhibit 2-3, City of Baldwin Park Zoning Map, and City of Monrovia General Plan Land Use Element Figure 1.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road; "n/a" = Roadway segment does not exist in the given scenario.

## 7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 67.0 to 80.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 67.2 to 80.9 dBA CNEL. As shown on Table 7-7 the Project will generate a noise level increase of up to 1.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Existing conditions at the land uses adjacent to roadways conveying Project traffic.

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

| ID | Road | Segment | CNEL at Adjacent Land Use (dBA)[1] | | | Noise-Sensitive Land Use? | Threshold Exceeded?[2] |
|---|---|---|---|---|---|---|---|
| | | | No Project | With Project | Project Addition | | |
| 1 | Myrtle Av. | n/o Longden Av. | 78.0 | 78.0 | 0.0 | No | No |
| 2 | Peck Rd. | s/o Arrow Hwy. | 73.4 | 73.4 | 0.0 | No | No |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 71.7 | 71.9 | 0.2 | No | No |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 75.8 | 75.8 | 0.0 | No | No |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 71.1 | 71.7 | 0.6 | No | No |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 67.9 | 69.1 | 1.2 | No | No |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 76.3 | 76.4 | 0.1 | No | No |
| 8 | Stewart Av. | s/o Live Oak Av. | 67.0 | 67.2 | 0.2 | Yes | No |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 71.9 | 72.0 | 0.1 | Yes | No |
| 10 | Maine Av. | s/o Arrow Hwy. | 70.8 | 70.9 | 0.1 | Yes | No |
| 11 | Longden Av. | w/o Myrtle Av. | 75.1 | 75.2 | 0.1 | Yes | No |
| 12 | Longden Av. | e/o Myrtle Av. | 76.1 | 76.2 | 0.1 | No | No |
| 13 | Live Oak Av. | w/o Peck Rd. | 75.6 | 75.7 | 0.1 | Yes | No |
| 14 | Arrow Hwy. | e/o Peck Rd. | 78.1 | 78.2 | 0.1 | No | No |
| 15 | Arrow Hwy. | e/o Longden Av. | 80.5 | 80.6 | 0.1 | No | No |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 78.8 | 78.9 | 0.1 | No | No |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 78.2 | 78.4 | 0.2 | No | No |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 77.6 | 77.7 | 0.1 | No | No |
| 19 | Arrow Hwy. | w/o Maine Av. | 80.8 | 80.9 | 0.1 | No | No |
| 20 | Arrow Hwy. | e/o Maine Av. | 79.5 | 79.6 | 0.1 | No | No |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 79.2 | 79.3 | 0.1 | No | No |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 79.6 | 79.7 | 0.1 | No | No |
| 23 | Live Oak Av. | e/o Stewart Av. | 79.5 | 79.5 | 0.0 | No | No |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 78.8 | 78.8 | 0.0 | No | No |

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

## 7.3 OPENING YEAR 2020 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Opening Year 2020 without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 67.8 to 81.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year 2020 with Project conditions will range from 67.8 to 81.4 dBA CNEL. As shown on Table 7-8 the Project will generate a noise level increase of up to 1.2 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Opening Year 2020 conditions at the land uses adjacent to roadways conveying Project traffic.

**TABLE 7-8: OPENING YEAR OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS**

| ID | Road | Segment | CNEL at Adjacent Land Use (dBA)[1] | | | Noise-Sensitive Land Use? | Threshold Exceeded?[2] |
|---|---|---|---|---|---|---|---|
| | | | No Project | With Project | Project Addition | | |
| 1 | Myrtle Av. | n/o Longden Av. | 78.3 | 78.3 | 0.0 | No | No |
| 2 | Peck Rd. | s/o Arrow Hwy. | 73.7 | 73.7 | 0.0 | No | No |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 72.2 | 72.3 | 0.1 | No | No |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 76.3 | 76.3 | 0.0 | No | No |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 72.9 | 73.3 | 0.4 | No | No |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 68.1 | 69.3 | 1.2 | No | No |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 77.5 | 77.6 | 0.1 | No | No |
| 8 | Stewart Av. | s/o Live Oak Av. | 67.8 | 67.8 | 0.0 | Yes | No |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 72.5 | 72.6 | 0.1 | Yes | No |
| 10 | Maine Av. | s/o Arrow Hwy. | 71.5 | 71.5 | 0.0 | Yes | No |
| 11 | Longden Av. | w/o Myrtle Av. | 75.5 | 75.5 | 0.0 | Yes | No |
| 12 | Longden Av. | e/o Myrtle Av. | 76.5 | 76.6 | 0.1 | No | No |
| 13 | Live Oak Av. | w/o Peck Rd. | 76.1 | 76.1 | 0.0 | Yes | No |
| 14 | Arrow Hwy. | e/o Peck Rd. | 78.7 | 78.7 | 0.0 | No | No |
| 15 | Arrow Hwy. | e/o Longden Av. | 81.0 | 81.1 | 0.1 | No | No |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 79.4 | 79.6 | 0.2 | No | No |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 78.6 | 78.8 | 0.2 | No | No |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 78.5 | 78.6 | 0.1 | No | No |
| 19 | Arrow Hwy. | w/o Maine Av. | 81.4 | 81.4 | 0.0 | No | No |
| 20 | Arrow Hwy. | e/o Maine Av. | 80.1 | 80.1 | 0.0 | No | No |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 79.8 | 79.9 | 0.1 | No | No |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 80.2 | 80.2 | 0.0 | No | No |
| 23 | Live Oak Av. | e/o Stewart Av. | 80.0 | 80.0 | 0.0 | No | No |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 79.4 | 79.4 | 0.0 | No | No |

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

## 7.4 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents the Horizon Year 2040 without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 68.0 to 81.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Horizon Year 2040 with Project conditions will range from 68.1 to 81.6 dBA CNEL. As shown on Table 7-9 the Project will generate a noise level increase of up to 1.1 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Horizon Year 2040 conditions at the land uses adjacent to roadways conveying Project traffic.

**TABLE 7-9: HORIZON YEAR 2040 PROJECT TRAFFIC NOISE IMPACTS**

| ID | Road | Segment | CNEL at Adjacent Land Use (dBA)[1] | | | Noise-Sensitive Land Use? | Threshold Exceeded?[2] |
|---|---|---|---|---|---|---|---|
| | | | No Project | With Project | Project Addition | | |
| 1 | Myrtle Av. | n/o Longden Av. | 78.5 | 78.6 | 0.1 | No | No |
| 2 | Peck Rd. | s/o Arrow Hwy. | 73.7 | 73.8 | 0.1 | No | No |
| 3 | Avenida Barbosa | n/o Buena Vista St. | 72.5 | 72.6 | 0.1 | No | No |
| 4 | Avenida Barbosa | s/o Buena Vista St. | 76.5 | 76.6 | 0.1 | No | No |
| 5 | Rivergrade Rd. | s/o Arrow Hwy. | 73.1 | 73.5 | 0.4 | No | No |
| 6 | Rivergrade Rd. | s/o Stewart Av. | 68.4 | 69.5 | 1.1 | No | No |
| 7 | Rivergrade Rd. | s/o Live Oak Av. | 77.7 | 77.8 | 0.1 | No | No |
| 8 | Stewart Av. | s/o Live Oak Av. | 68.0 | 68.1 | 0.1 | Yes | No |
| 9 | Baldwin Park Bl. | s/o Live Oak Av. | 72.8 | 72.8 | 0.0 | Yes | No |
| 10 | Maine Av. | s/o Arrow Hwy. | 71.7 | 71.8 | 0.1 | Yes | No |
| 11 | Longden Av. | w/o Myrtle Av. | 75.7 | 75.8 | 0.1 | Yes | No |
| 12 | Longden Av. | e/o Myrtle Av. | 76.8 | 76.9 | 0.1 | No | No |
| 13 | Live Oak Av. | w/o Peck Rd. | 76.3 | 76.4 | 0.1 | Yes | No |
| 14 | Arrow Hwy. | e/o Peck Rd. | 78.9 | 79.0 | 0.1 | No | No |
| 15 | Arrow Hwy. | e/o Longden Av. | 81.3 | 81.3 | 0.0 | No | No |
| 16 | Arrow Hwy. | e/o I-605 Fwy. | 79.6 | 79.8 | 0.2 | No | No |
| 17 | Arrow Hwy. | w/o Rivergrade Rd. | 78.9 | 79.1 | 0.2 | No | No |
| 18 | Arrow Hwy. | e/o Rivergrade Rd. | 78.7 | 78.8 | 0.1 | No | No |
| 19 | Arrow Hwy. | w/o Maine Av. | 81.6 | 81.6 | 0.0 | No | No |
| 20 | Arrow Hwy. | e/o Maine Av. | 80.3 | 80.4 | 0.1 | No | No |
| 21 | Live Oak Av. | w/o Rivergrade Rd. | 80.1 | 80.1 | 0.0 | No | No |
| 22 | Live Oak Av. | e/o Rivergrade Rd. | 80.4 | 80.5 | 0.1 | No | No |
| 23 | Live Oak Av. | e/o Stewart Av. | 80.2 | 80.3 | 0.1 | No | No |
| 24 | Live Oak Av. | w/o Arrow Hwy. | 79.6 | 79.7 | 0.1 | No | No |

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

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# 8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following 11 receiver locations as shown on Exhibit 8-A were identified as representative locations for focused analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, quarry, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Sensitive receivers in the Project study area include existing residential homes and school uses, as described below, at locations R1 to R7. Non-noise-sensitive receiver locations are identified below, at locations R8 to R11, to evaluate potential impacts related to the operational and construction noise level standards identified on Table 3-1 within each applicable jurisdiction. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 4,245 feet west of the Project site, R1 represents an existing residential community north of Arrow Highway/Live Oak Avenue. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents existing residential homes located approximately 1,900 feet north of the Project site. A 24-hour noise level measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents an existing residential homes and Beardslee Elementary School located roughly 4,532 feet north of the Project site. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing Santa Fe Dam Recreation Area located roughly 6,315 feet east of the Project site. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents existing residential homes located roughly 4,358 feet southeast of the Project site, south of Live Oak Avenue. A 24-hour noise level measurement was taken east of this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents Olive Middle School, Walnut Elementary School, and existing residential homes located approximately 3,516 feet southeast of the Project site. A 24-

hour noise level measurement was taken near this location, L6, to describe the existing ambient noise environment.

R7: Located approximately 5,590 feet south of the Project site, R7 represents existing residential homes. A 24-hour noise level measurement was taken near this location, L7, to describe the existing ambient noise environment.

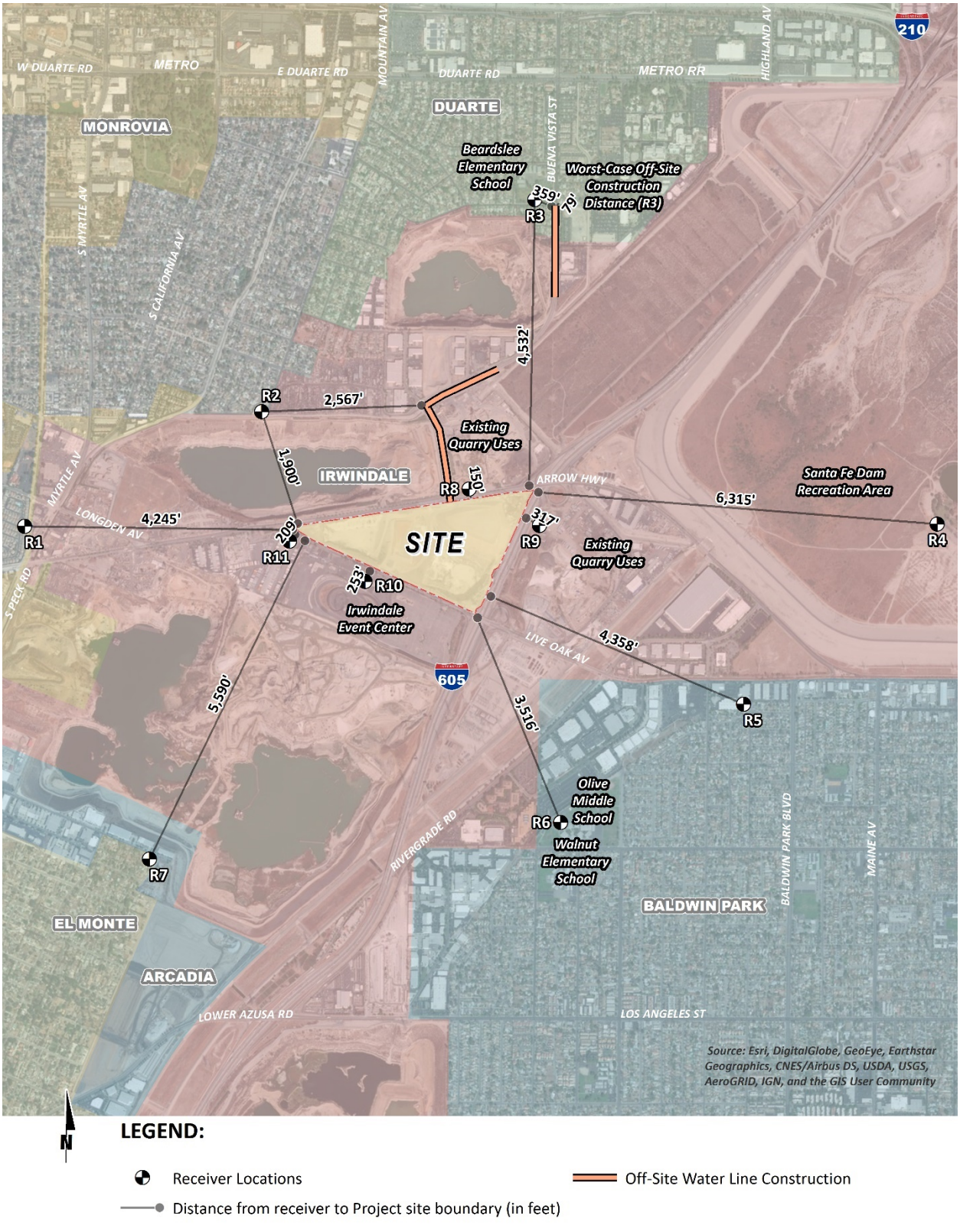
R8: Location R8 represents existing quarry uses north of the Project site at roughly 150 feet across Arrow Highway. The 24-hour noise level measurement at location L8 is used to describe the existing ambient noise environment at this receiver location.

R9: Location R9 represents existing quarry uses located roughly 317 feet east of the Project site across I-605. The 24-hour noise level measurement at location L8 is used to describe the existing ambient noise environment at this receiver location.

R10: Location R10 represents the Irwindale Event Center located approximately 253 feet south of the Project site. The 24-hour noise level measurement at location L8 is used to describe the existing ambient noise environment at this receiver location.

R11: Located approximately 209 feet southwest of the Project site, R11 represents existing industrial uses, west of the Irwindale Event Center. The 24-hour noise level measurement at location L8 is used to describe the existing ambient noise environment at this receiver location.

## EXHIBIT 8-A: RECEIVER LOCATIONS



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# 9 OPERATIONAL IMPACTS

This section analyzes the potential operational noise impacts due to the Project's stationary noise sources on the off-site sensitive receiver locations identified in Section 8. Exhibit 9-A identifies the receiver locations and noise source locations used to assess the Project-related operational noise levels.

## 9.1 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, refrigerated containers or reefers, roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activity all operating continuously. These noise level impacts will likely vary throughout the day.

**TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS**

| Noise Source | Duration (hh:mm:ss) | Ref. Distance (Feet) | Noise Source Height (Feet) | Hourly Activity (Mins)[6] | Reference Noise Level (dBA $L_{eq}$) | |
|---|---|---|---|---|---|---|
| | | | | | @ Ref. Dist. | @ 50 Feet |
| Truck Idle/Reefer Activity[1] | 00:14:00 | 30' | 8' | 60 | 70.1 | 65.7 |
| Roof-Top Air Conditioning Units[2] | 96:00:00 | 5' | 25' | 39 | 77.2 | 57.2 |
| Drive-Through Speakerphone[3] | 02:00:00 | 15' | 3' | 60 | 62.0 | 51.5 |
| Parking Lot Vehicle Movements[4] | 01:00:00 | 10' | 5' | 60 | 52.2 | 41.7 |
| Gas Station Activity[5] | 00:03:00 | 5' | 5' | 60 | 68.2 | 48.2 |

[1] As measured by Urban Crossroads, Inc. on 1/7/2015 at the Nature's Best Distribution Facility in the City of Chino.
[2] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[3] As measured by Urban Crossroads, Inc. on 12/19/2014 at the Panera Bread located at 423 Associated Road in the City of Brea.
[4] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[5] As measured by Urban Crossroads, Inc. on 4/26/2016 at the Quail Hill ARCO gas station in the City of Irvine.
[6] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

### 9.1.1 WORST-CASE LAND USE ASSUMPTIONS

As previously shown on Exhibit 1-B, and described in Section 1.2, the Project land uses within Planning Areas 1A, 2A, and 3A may vary in location at the time of actual Project operation. Therefore, this analysis assumes all noise sources, both industrial and commercial-use related, may operate at the closest point within the Project site to each nearby receiver location. Using this approach, a conservative analysis is presented herein which accounts for the potential land use configurations previously shown on Exhibit 1-B.

### 9.1.2 TRUCK IDLING, LOADING/UNLOADING, BACKUP ALARMS, AND REFRIGERATED CONTAINERS

On Wednesday, January 7th, 2015, Urban Crossroads, Inc. collected short-term operational noise level measurements at the Nature's Best distribution facility located at 16081 Fern Avenue in the City of Chino. Operations at the Nature's Best distribution facility measurements represent the typical weekday logistics warehouse activities with both dry goods and cold storage from a single building, of approximately 397,000 square feet, with loading dock areas located on both sides of the building. To describe the loading dock activities, a reference noise level measurement was collected to represent the truck idling/reefer activity. A second reference noise level measurement at this location was collected to assess the entry gate noise source activity.

During the 14-minute truck idling/reefer activity reference noise level measurement, approximately 20 delivery trucks were docked, idling, or parked in the northern loading dock area. The truck idling/reefer activity reference noise level measurement was taken in the center of the loading dock activity area and represents multiple concurrent noise sources resulting in a combined noise level of 65.7 dBA $L_{eq}$ at a uniform reference distance of 50 feet.

Specifically, the truck idling/reefer activity reference noise level measurement represents one truck located approximately 30 feet from the noise level meter with another truck passing by to park roughly 20 feet away, both with their engines idling. Throughout the reference noise level measurement, a separate docked and running reefer truck was located approximately 50 feet east of the measurement location. Additional background noise sources included truck pass-by noise, truck drivers talking to each other next to docked trucks, and air brake release noise when trucks parked.

### 9.1.3 ROOF-TOP AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA $L_{eq}$. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA $L_{eq}$. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours for a total of 39 minutes per hour. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

### 9.1.4 DRIVE-THROUGH SPEAKERPHONE

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

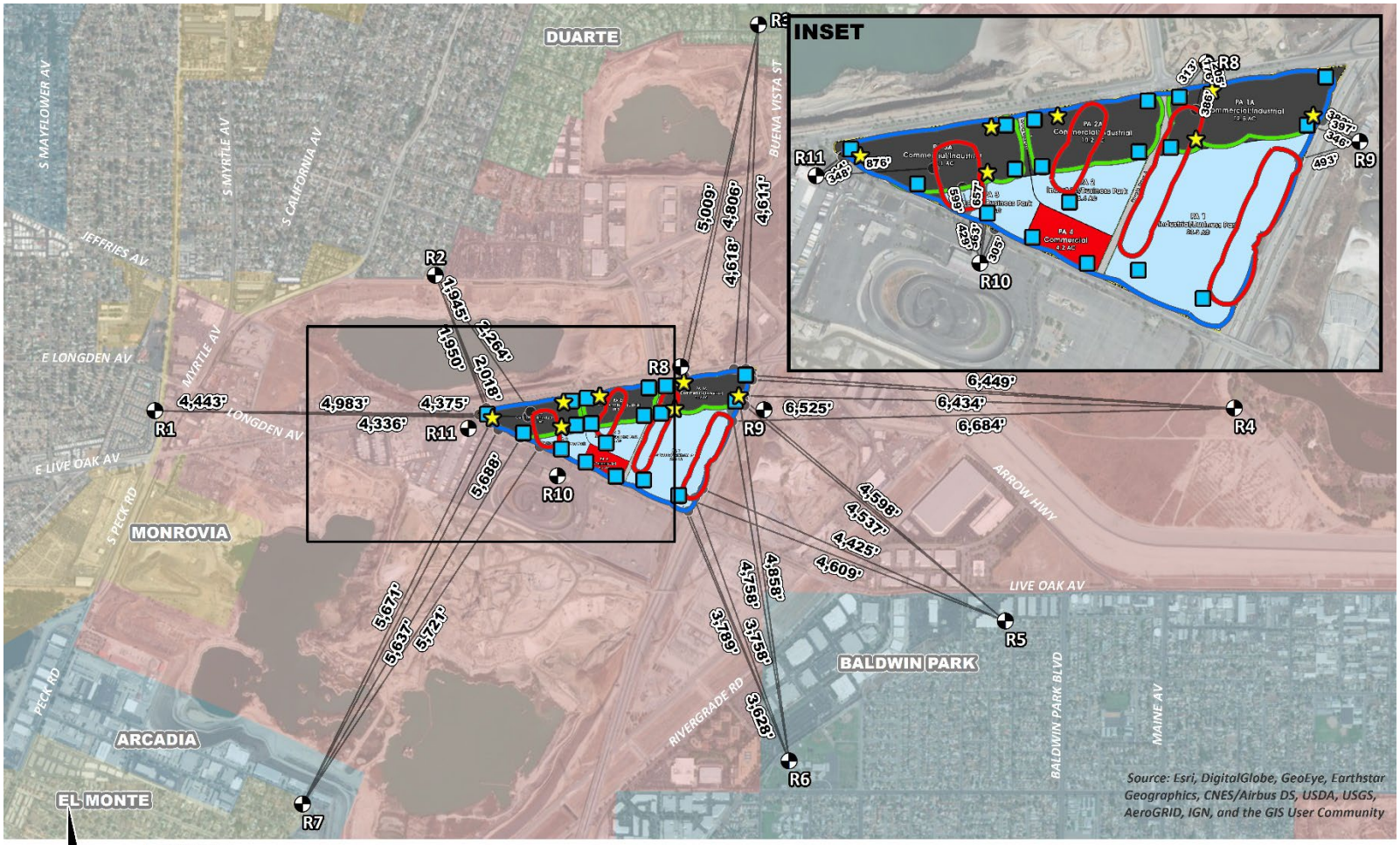
### 9.1.5 PARKING LOT VEHICLE MOVEMENTS (AUTOS)

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

### 9.1.6 GAS STATION ACTIVITY

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

## EXHIBIT 9-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS



## 9.2 OPERATIONAL NOISE LEVELS

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

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

Where $SPL_2$ is the resulting noise level after attenuation, $SPL_1$ is the source noise level, $D_2$ is the distance to the reference sound pressure level ($SPL_1$), and $D_1$ is the distance to the receiver location. Table 9-2 indicates that the unmitigated operational noise levels associated with the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, refrigerated containers or reefers, roof-top air conditioning units, drive-through speakerphones, parking lot vehicle movements, and gas station activity are expected to range from 23.9 to 33.4 dBA $L_{eq}$ at noise-sensitive receiver locations R1 to R7, and from 44.3 to 49.4 dBA $L_{eq}$ at non-noise sensitive receiver locations R8 to R11. The unmitigated operational noise level calculation worksheets are included in Appendix 9.1.

**TABLE 9-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS**

| Receiver Location[1] | Noise Levels by Individual Source[2] | | | | | Combined Operational Noise Levels (dBA $L_{eq}$)[3] |
|---|---|---|---|---|---|---|
| | Truck Idle/Reefer Activity | Roof-Top Air Conditioning Unit | Drive-Through Speakerphone | Parking Lot Vehicle Movements | Gas Station Activity | |
| R1 | 25.7 | 16.5 | 12.6 | 12.6 | 9.4 | 26.6 |
| R2 | 32.5 | 23.5 | 19.4 | 17.9 | 16.4 | 33.4 |
| R3 | 25.6 | 15.6 | 11.9 | 12.2 | 8.9 | 26.4 |
| R4 | 23.1 | 13.1 | 9.2 | 10.1 | 6.0 | 23.9 |
| R5 | 26.7 | 16.0 | 12.3 | 12.3 | 9.0 | 27.4 |
| R6 | 28.1 | 17.7 | 11.8 | 13.8 | 8.6 | 28.8 |
| R7 | 24.5 | 14.2 | 10.4 | 10.9 | 7.2 | 25.3 |
| R8 | 47.9 | 39.4 | 39.3 | 33.5 | 37.3 | 49.4 |
| R9 | 45.8 | 37.3 | 33.9 | 29.1 | 31.4 | 46.8 |
| R10 | 44.1 | 38.1 | 29.2 | 29.9 | 26.6 | 45.4 |
| R11 | 40.8 | 39.3 | 34.7 | 30.7 | 33.5 | 44.3 |

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

## 9.3 OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Irwindale and adjacent jurisdictions' noise level standards. Table 9-3 shows the operational noise levels associated with The Park at Live Oak Project will satisfy the exterior noise level standards at all nearby sensitive receiver locations, under each applicable jurisdictions' standards. Therefore, operational noise impacts are considered *less than significant*.

**TABLE 9-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE**

| Receiver Location[1] | City | Land Use | Noise Level at Receiver Locations (dBA $L_{eq}$)[2] | Thresholds at Receiving Land Use (dBA $L_{eq}$) | | | Threshold Exceeded?[3] | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Daytime | Evening | Nighttime | Daytime | Evening | Nighttime |
| R1 | Irwindale | Noise-Sensitive (Residential Standards) | 26.6 | 50 | - | 45 | No | - | No |
| R2 | Irwindale | | 33.4 | 50 | - | 45 | No | - | No |
| R3 | Duarte | | 26.4 | 55 | - | 45 | No | - | No |
| R4 | Irwindale | | 23.9 | 50 | - | 45 | No | - | No |
| R5 | Baldwin Park | | 27.4 | 55 | 50 | 45 | No | No | No |
| R6 | Baldwin Park | | 28.8 | 55 | 50 | 45 | No | No | No |
| R7 | El Monte | | 25.3 | 50 | - | 45 | No | - | No |
| R8 | Irwindale | Industrial | 49.4 | 70 | - | 60 | No | - | No |
| R9 | Irwindale | | 46.8 | 70 | - | 60 | No | - | No |
| R10 | Irwindale | | 45.4 | 70 | - | 60 | No | - | No |
| R11 | Irwindale | | 44.3 | 70 | - | 60 | No | - | No |

[1] See Exhibit 9-A for the receiver and noise source locations.
[2] Estimated Project operational noise levels as shown on Table 9-2.
[3] Do the estimated Project operational noise levels meet the operational noise level thresholds?
"-" = Jurisdiction does not identify evening noise level limits (daytime and nighttime only); "Daytime," "Evening," and "Nighttime" based on the hours specified on Table 3-1 by each respective jurisdiction.

## 9.4 PROJECT OPERATIONAL NOISE CONTRIBUTION

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

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

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

As indicated on Tables 9-4 and 9-5, the Project will not contribute an operational noise level increase during the daytime hours and will contribute an operational noise level increase during the nighttime hours of up to 0.1 dBA $L_{eq}$. Based on the without Project (ambient) noise levels, the Project operational noise level increases will satisfy the significance criteria discussed in Section 4, and therefore, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic, or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.

**TABLE 9-4: DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS**

| Receiver Location[1] | Total Project Operational Noise Level[2] | Measurement Location[3] | Reference Ambient Noise Levels[4] | Combined Project and Ambient[5] | Project Contribution[6] | Threshold Exceeded?[7] |
|---|---|---|---|---|---|---|
| R1 | 26.6 | L1 | 66.3 | 66.3 | 0.0 | No |
| R2 | 33.4 | L2 | 67.2 | 67.2 | 0.0 | No |
| R3 | 26.4 | L3 | 55.3 | 55.3 | 0.0 | No |
| R4 | 23.9 | L4 | 51.8 | 51.8 | 0.0 | No |
| R5 | 27.4 | L5 | 56.1 | 56.1 | 0.0 | No |
| R6 | 28.8 | L6 | 56.3 | 56.3 | 0.0 | No |
| R7 | 25.3 | L7 | 53.2 | 53.2 | 0.0 | No |
| R4 | 49.4 | L8 | 80.1 | 80.1 | 0.0 | No |
| R5 | 46.8 | L8 | 80.1 | 80.1 | 0.0 | No |
| R6 | 45.4 | L8 | 80.1 | 80.1 | 0.0 | No |
| R7 | 44.3 | L8 | 80.1 | 80.1 | 0.0 | No |

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

**TABLE 9-5: NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS**

| Receiver Location[1] | Total Project Operational Noise Level[2] | Measurement Location[3] | Reference Ambient Noise Levels[4] | Combined Project and Ambient[5] | Project Contribution[6] | Threshold Exceeded?[7] |
|---|---|---|---|---|---|---|
| R1 | 26.6 | L1 | 63.3 | 63.3 | 0.0 | No |
| R2 | 33.4 | L2 | 62.9 | 62.9 | 0.0 | No |
| R3 | 26.4 | L3 | 51.0 | 51.0 | 0.0 | No |
| R4 | 23.9 | L4 | 43.0 | 43.1 | 0.1 | No |
| R5 | 27.4 | L5 | 53.3 | 53.3 | 0.0 | No |
| R6 | 28.8 | L6 | 54.7 | 54.7 | 0.0 | No |
| R7 | 25.3 | L7 | 49.5 | 49.5 | 0.0 | No |
| R4 | 49.4 | L8 | 76.4 | 76.4 | 0.0 | No |
| R5 | 46.8 | L8 | 76.4 | 76.4 | 0.0 | No |
| R6 | 45.4 | L8 | 76.4 | 76.4 | 0.0 | No |
| R7 | 44.3 | L8 | 76.4 | 76.4 | 0.0 | No |

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

## 9.5 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities the threshold described in Section 4 for vibration of 0.01 in/sec RMS is used. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for The Park at Live Oak heavy truck activity at normal traffic speeds will approach 0.004 in/sec PPV and 0.003 in/sec RMS at 25 feet based on the FTA *Transit Noise Impact and Vibration Assessment.* (3) Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby receivers will not exceed the vibration threshold of 0.01 in/sec RMS, and therefore, will be *less than significant*.

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# 10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction activity boundaries in relation to the nearby sensitive receiver locations.

## 10.1 CONSTRUCTION NOISE LEVELS

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

- Site Preparation
- Grading
- Building Construction
- Architectural Coating
- Paving
- Off-Site Water Line Construction

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA when measured at 50 feet. Hard site conditions are used in the construction noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source (i.e. construction equipment). For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the data used to support the construction emissions in *The Park at Live Oak Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (20)

## 10.2 CONSTRUCTION REFERENCE NOISE LEVELS

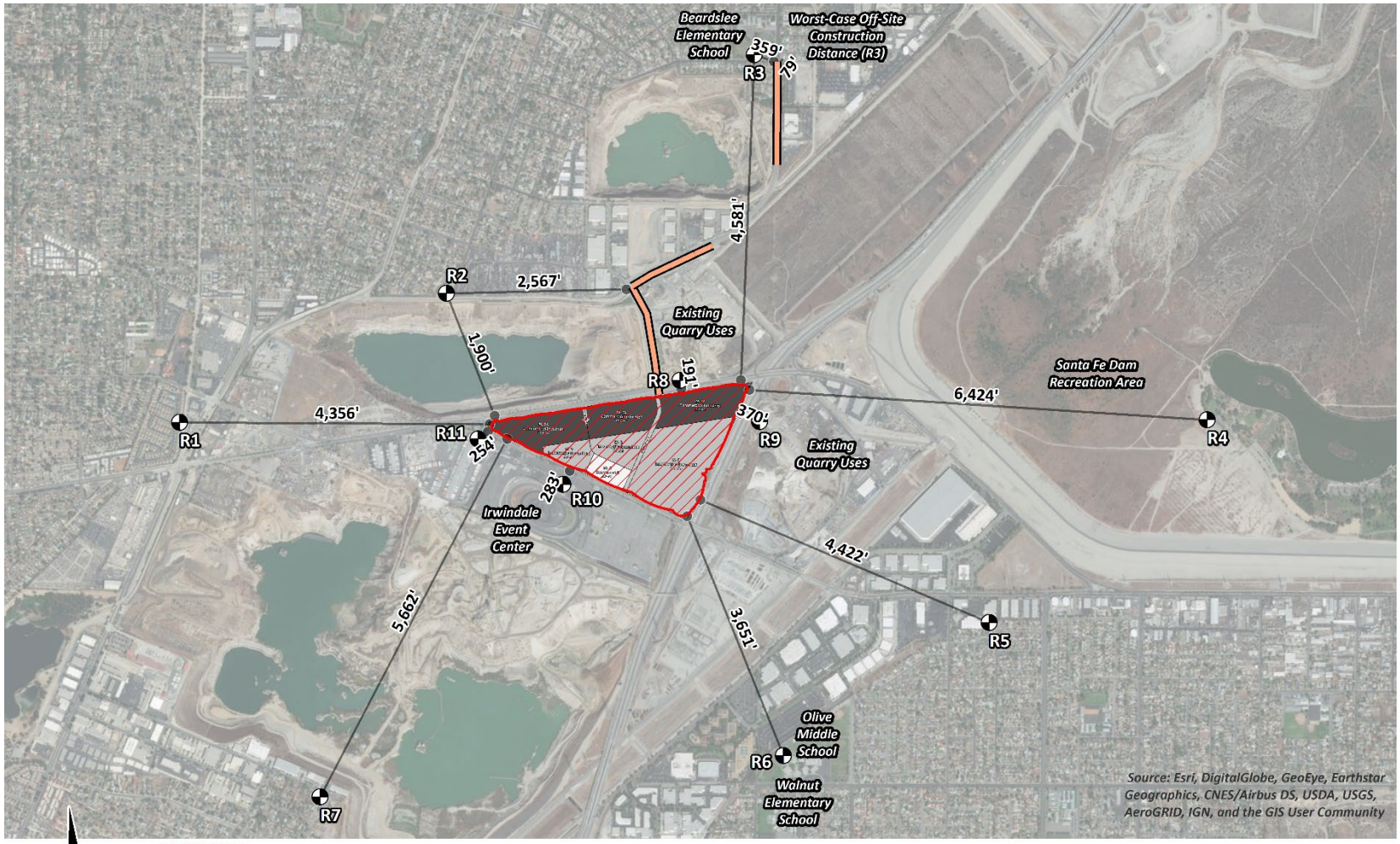
To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances, all construction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

**TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS**

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

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within a construction site located in the City of Ontario.
[5] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[6] As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing paved parking lot at 41 Corporate Park in Irvine.
[7] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

## EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



## 10.3 CONSTRUCTION NOISE ANALYSIS

Tables 10-2 to 10-6 show the Project construction stages and the reference construction noise levels used for each stage. Table 10-7 provides a summary of the noise levels from each stage of construction at each of the receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the highest reference noise level is operating at the edge of primary construction activity nearest each sensitive receiver location will range from 32.4 to 67.9 dBA $L_{eq}$ at the sensitive receiver locations, as shown on Table 10-7.

**TABLE 10-2: SITE PREPARATION ACTIVITY NOISE LEVELS**

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

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R1 | 4,356' | -38.8 | -5.0 | 35.8 |
| R2 | 2,517' | -34.0 | -5.0 | 40.5 |
| R3 | 4,581' | -39.2 | -5.0 | 35.3 |
| R4 | 6,424' | -42.2 | -5.0 | 32.4 |
| R5 | 4,422' | -38.9 | -5.0 | 35.6 |
| R6 | 3,651' | -37.3 | -5.0 | 37.3 |
| R7 | 5,662' | -41.1 | -5.0 | 33.5 |
| R8 | 191' | -11.6 | 0.0 | 67.9 |
| R9 | 370' | -17.4 | 0.0 | 62.2 |
| R10 | 283' | -15.1 | 0.0 | 64.5 |
| R11 | 254' | -14.1 | 0.0 | 65.4 |

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

**TABLE 10-3: GRADING ACTIVITY NOISE LEVELS**

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

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R1 | 4,356' | -38.8 | -5.0 | 35.8 |
| R2 | 2,517' | -34.0 | -5.0 | 40.5 |
| R3 | 4,581' | -39.2 | -5.0 | 35.3 |
| R4 | 6,424' | -42.2 | -5.0 | 32.4 |
| R5 | 4,422' | -38.9 | -5.0 | 35.6 |
| R6 | 3,651' | -37.3 | -5.0 | 37.3 |
| R7 | 5,662' | -41.1 | -5.0 | 33.5 |
| R8 | 191' | -11.6 | 0.0 | 67.9 |
| R9 | 370' | -17.4 | 0.0 | 62.2 |
| R10 | 283' | -15.1 | 0.0 | 64.5 |
| R11 | 254' | -14.1 | 0.0 | 65.4 |

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

**TABLE 10-4: BUILDING CONSTRUCTION ACTIVITY NOISE LEVELS**

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

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R1 | 4,356' | -38.8 | -5.0 | 24.4 |
| R2 | 2,517' | -34.0 | -5.0 | 29.1 |
| R3 | 4,581' | -39.2 | -5.0 | 23.9 |
| R4 | 6,424' | -42.2 | -5.0 | 21.0 |
| R5 | 4,422' | -38.9 | -5.0 | 24.2 |
| R6 | 3,651' | -37.3 | -5.0 | 25.9 |
| R7 | 5,662' | -41.1 | -5.0 | 22.1 |
| R8 | 191' | -11.6 | 0.0 | 56.5 |
| R9 | 370' | -17.4 | 0.0 | 50.8 |
| R10 | 283' | -15.1 | 0.0 | 53.1 |
| R11 | 254' | -14.1 | 0.0 | 54.0 |

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

**TABLE 10-5: ARCHITECTURAL COATING ACTIVITY NOISE LEVELS**

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

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R1 | 4,356' | -38.8 | -5.0 | 24.4 |
| R2 | 2,517' | -34.0 | -5.0 | 29.1 |
| R3 | 4,581' | -39.2 | -5.0 | 23.9 |
| R4 | 6,424' | -42.2 | -5.0 | 21.0 |
| R5 | 4,422' | -38.9 | -5.0 | 24.2 |
| R6 | 3,651' | -37.3 | -5.0 | 25.9 |
| R7 | 5,662' | -41.1 | -5.0 | 22.1 |
| R8 | 191' | -11.6 | 0.0 | 56.5 |
| R9 | 370' | -17.4 | 0.0 | 50.8 |
| R10 | 283' | -15.1 | 0.0 | 53.1 |
| R11 | 254' | -14.1 | 0.0 | 54.0 |

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

**TABLE 10-6: PAVING ACTIVITY NOISE LEVELS**

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

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R1 | 4,356' | -38.8 | -5.0 | 27.8 |
| R2 | 2,517' | -34.0 | -5.0 | 32.6 |
| R3 | 4,581' | -39.2 | -5.0 | 27.4 |
| R4 | 6,424' | -42.2 | -5.0 | 24.4 |
| R5 | 4,422' | -38.9 | -5.0 | 27.7 |
| R6 | 3,651' | -37.3 | -5.0 | 29.3 |
| R7 | 5,662' | -41.1 | -5.0 | 25.5 |
| R8 | 191' | -11.6 | 0.0 | 60.0 |
| R9 | 370' | -17.4 | 0.0 | 54.2 |
| R10 | 283' | -15.1 | 0.0 | 56.5 |
| R11 | 254' | -14.1 | 0.0 | 57.5 |

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

**TABLE 10-7: UNMITIGATED CONSTRUCTION ACTIVITY NOISE LEVEL SUMMARY**

| Receiver Location[1] | Construction Noise Level (dBA $L_{eq}$) | | | | | |
|---|---|---|---|---|---|---|
| | Site Preparation | Grading | Building Construction | Architectural Coating | Paving | Highest Levels[2] |
| R1 | 35.8 | 35.8 | 24.4 | 24.4 | 27.8 | 35.8 |
| R2 | 43.0 | 43.0 | 31.6 | 31.6 | 35.0 | 43.0 |
| R3 | 35.3 | 35.3 | 23.9 | 23.9 | 27.4 | 35.3 |
| R4 | 32.4 | 32.4 | 21.0 | 21.0 | 24.4 | 32.4 |
| R5 | 35.6 | 35.6 | 24.2 | 24.2 | 27.7 | 35.6 |
| R6 | 37.3 | 37.3 | 25.9 | 25.9 | 29.3 | 37.3 |
| R7 | 33.5 | 33.5 | 22.1 | 22.1 | 25.5 | 33.5 |
| R8 | 67.9 | 67.9 | 56.5 | 56.5 | 60.0 | 67.9 |
| R9 | 62.2 | 62.2 | 50.8 | 50.8 | 54.2 | 62.2 |
| R10 | 64.5 | 64.5 | 53.1 | 53.1 | 56.5 | 64.5 |
| R11 | 65.4 | 65.4 | 54.0 | 54.0 | 57.5 | 65.4 |

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

## 10.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

Table 10-8 shows the highest construction noise levels at the potentially impacted receiver locations during Project construction activities. As shown on Table 10-8, the construction noise levels are expected to range from 32.4 to 67.9 dBA $L_{eq}$ and will satisfy the City of Irwindale 5 dBA $L_{eq}$ above the ambient noise level significance threshold during temporary Project construction activities at all receiver locations, during both the daytime and nighttime hours. Therefore, the unmitigated noise impact due to Project construction is considered *less than significant*.

**TABLE 10-8: UNMITIGATED CONSTRUCTION ACTIVITY NOISE LEVEL COMPLIANCE**

| Receiver Location[1] | Jurisdiction | Land Use | Highest Project Construction Noise Level[2] | Existing Ambient Noise Level[3] | | Plus 5 dBA Threshold for Construction Noise | Threshold[4] | | Threshold Exceeded?[5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Daytime | Nighttime | | Daytime | Nighttime | Daytime | Nighttime |
| R1 | Irwindale | Noise-Sensitive (Residential Standards) | 35.8 | 66.3 | 63.3 | +5 | 71.3 | 68.3 | No | No |
| R2 | Irwindale | | 43.0 | 67.2 | 62.9 | +5 | 72.2 | 67.9 | No | No |
| R3 | Duarte | | 35.3 | 55.3 | 51.0 | +5 | 60.3 | 56.0 | No | No |
| R4 | Irwindale | | 32.4 | 51.8 | 43.0 | +5 | 56.8 | 48.0 | No | No |
| R5 | Baldwin Park | | 35.6 | 56.1 | 53.3 | +5 | 61.1 | 58.3 | No | No |
| R6 | Baldwin Park | | 37.3 | 56.3 | 54.7 | +5 | 61.3 | 59.7 | No | No |
| R7 | El Monte | | 33.5 | 53.2 | 49.5 | +5 | 58.2 | 54.5 | No | No |
| R8 | Irwindale | Industrial | 67.9 | 80.1 | 76.4 | +5 | 85.1 | 81.4 | No | No |
| R9 | Irwindale | | 62.2 | 80.1 | 76.4 | +5 | 85.1 | 81.4 | No | No |
| R10 | Irwindale | | 64.5 | 80.1 | 76.4 | +5 | 85.1 | 81.4 | No | No |
| R11 | Irwindale | | 65.4 | 80.1 | 76.4 | +5 | 85.1 | 81.4 | No | No |

[1] See Exhibit 10-A for the sensitive receiver locations.
[2] Highest Project construction noise levels as shown on Table 10-7.
[3] Ambient exterior noise level at each receiver location (Table 5-1), since the existing ambient noise levels already exceed the base exterior noise level standards shown on Table 3-1.
[4] Ambient exterior noise level standard plus 5 dBA per the City of Irwindale Municipal Code, Section 9.28.110.
[5] Do the highest Project construction noise levels exceed the ambient plus 5 dBA threshold?

#### OFF-SITE WATER LINE CONSTRUCTION NOISE LEVELS

In addition, Table 10-9 shows the off-site water line daytime construction noise levels at the closest receiver locations, R2 and R3, as previously shown on Exhibit 10-A. The Project-related off-site water line daytime construction noise levels are anticipated to range from 29.0 to 59.2 dBA $L_{eq}$ and will satisfy the 72.2 dBA $L_{eq}$ daytime standard based on ambient conditions at receiver location R2, and the 60.3 dBA $L_{eq}$ daytime standard based on ambient noise conditions at receiver location R3, thereby resulting in *less than significant* noise impacts.

**TABLE 10-9: OFF-SITE WATER LINE CONSTRUCTION NOISE LEVELS**

| Reference Construction Activity[1] | Reference Noise Level @ 50 Feet (dBA $L_{eq}$) |
|---|---|
| Truck Pass-Bys & Dozer Activity | 59.2 |
| Foundation Trenching | 68.2 |
| Forklift, Jackhammer, & Metal Truck Bed Activities | 67.9 |
| Highest Reference Noise Level at 50 Feet (dBA $L_{eq}$): | 68.2 |

| Receiver Location | Distance to Construction Activity (Feet)[2] | Distance Attenuation (dBA $L_{eq}$)[3] | Estimated Noise Barrier Attenuation (dBA $L_{eq}$)[4] | Construction Noise Level (dBA $L_{eq}$) |
|---|---|---|---|---|
| R2 | 2,567' | -34.2 | -5.0 | 29.0 |
| R3 | 79' | -4.0 | -5.0 | 59.2 |

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

## 10.5 CONSTRUCTION VIBRATION IMPACTS

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

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

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

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. At distances ranging from 191 to 6,424 feet from Project construction activities, construction vibration velocity levels are expected to approach 0.004 in/sec PPV, as shown on Table 10-10. To assess the human perception of vibration levels in PPV the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 10-10 shows the highest construction vibration levels in RMS are expected to approach 0.003 in/sec RMS at the nearby receiver locations. Based on the County of Los Angeles threshold of 0.01 in/sec RMS, the proposed Project construction activities will not exceed the vibration standard of 0.01 in/sec RMS at all receiver locations during Project construction. Therefore, the Project-related vibration impacts will be *less than significant* during the construction activities at the Project site.

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (3) The peak Project-construction vibration levels shown on Table 10-10, approaching 0.004 in/sec PPV, will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

**TABLE 10-10: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS**

| Receiver[1] | Distance to Const. Activity (Feet) | Receiver PPV Levels (in/sec)[2] | | | | | RMS Vibration Level[3] | Threshold Exceeded?[4] |
|---|---|---|---|---|---|---|---|---|
| | | Small Bulldozer | Jack-hammer | Loaded Trucks | Large Bulldozer | Highest Vibration Levels | | |
| R1 | 4,356' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R2 | 1,900' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R3 | 4,581' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R4 | 6,424' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R5 | 4,422' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R6 | 3,651' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R7 | 5,662' | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R8 | 191' | 0.000 | 0.002 | 0.004 | 0.004 | 0.004 | 0.003 | No |
| R9 | 370' | 0.000 | 0.001 | 0.001 | 0.002 | 0.002 | 0.001 | No |
| R10 | 283' | 0.000 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 | No |
| R11 | 254' | 0.000 | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | No |

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.
[3] Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[4] Do the highest vibration levels exceed the maximum acceptable vibration threshold shown on Table 4-2?

#### OFF-SITE WATER LINE CONSTRUCTION VIBRATION LEVELS

At distances ranging from 79 to 2,567 feet from Project off-site water line construction activities, construction vibration velocity levels are expected to approach 0.006 in/sec PPV, as shown on Table 10-11. The highest construction vibration levels in RMS are expected to approach 0.004 in/sec RMS at the nearby receiver locations. Based on the County of Los Angeles threshold of 0.01 in/sec RMS, the proposed Project off-site water line construction activities will not exceed the vibration standard of 0.01 in/sec RMS at the nearby sensitive receiver locations. Therefore, the Project-related vibration impacts will be *less than significant* during the off-site water line construction activities.

**TABLE 10-11: UNMITIGATED OFF-SITE CONSTRUCTION EQUIPMENT VIBRATION LEVELS**

| Receiver[1] | Distance to Off-Site Const. Activity (Feet) | Receiver PPV Levels (in/sec)[2] | | | RMS Vibration Level[3] | Threshold Exceeded?[4] |
|---|---|---|---|---|---|---|
| | | Small Bulldozer | Jack-hammer | Highest Vibration Levels | | |
| R2 | 2,567' | 0.000 | 0.000 | 0.000 | 0.000 | No |
| R3 | 79' | 0.001 | 0.006 | 0.006 | 0.004 | No |

[1] Closest sensitive receiver locations to the off-site water line locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.
[3] Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.
[4] Do the highest vibration levels exceed the maximum acceptable vibration threshold shown on Table 4-2?

# 11 REFERENCES


1. **State of California.** *California Environmental Quality Act, Appendix G.* 2016.
2. **Urban Crossroads, Inc.** *The Park at Live Oak Traffic Impact Analysis.* May 2018.
3. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
4. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
5. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
6. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
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8. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
9. **Office of Planning and Research.** *State of California General Plan Guidlines 2003.* October 2003.
10. **State of California.** *2016 California Green Building Standards Code.* January 2017.
11. **City of Irwindale.** *General Plan, Public Safety Element.*
12. —. *Municipal Code, Chapter 9.28 Noise Regulation.*
13. **County of Los Angeles.** *Municipal Code, Chapter 12.08.*
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15. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **Urban Crossroads, Inc.** *The Park at Live Oak Air Quality Impact Analysis.* June 2018.

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# 12 CERTIFICATION

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

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## EDUCATION

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

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

## PROFESSIONAL REGISTRATIONS

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

## PROFESSIONAL AFFILIATIONS

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

## PROFESSIONAL CERTIFICATIONS

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

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# APPENDIX 3.1:

# CITY OF IRWINDALE MUNICIPAL CODE

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Chapter 9.28 - NOISE REGULATION[]

Sections:

9.28.010 - Declaration of policy.

It is declared to be the policy of the city to prohibit unnecessary, excessive and annoying noises from all sources subject to its police power and contrary to the public interest. At certain levels noises are detrimental to the health and welfare of the citizenry and in the public interest shall be systematically proscribed.

(Ord. 297 § 1(part), 1976: prior code § 4800).

9.28.020 - Definitions.

As used in this chapter, unless the context otherwise clearly indicates, the words and phrases used in this chapter are defined as follows:

A. "Ambient base noise level" means reasonable and representative ambient noise levels in various land use categories in the city and at various times as established by the planning commission.

B. "Ambient noise level" means the all-encompassing noise associated with a given environment, usually being a composite of sounds with many sources excluding the alleged offensive noise at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

C. "Commercial purpose" means and includes the use, operation, or maintenance of any sound amplifying equipment for the purpose of advertising any business, or any good, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show entertainment, exhibition, or event, or for the purpose of demonstrating any such sound equipment.

D. "Decibel (dB)" means a unit of level which denotes the ratio between two quantities which are proportional to power; the number of decibels corresponding to the ratio of two amounts of power is ten times the logarithm to the base ten of this ratio.

E. "Emergency work" means work made necessary to restore property to a safe condition following a public calamity, or work required to protect persons or property from an imminent exposure to danger, or work performed by public utilities or public agencies and utility companies.

F. "Motor vehicles" includes, but is not limited to, off-road vehicles, minibikes and gocarts.

G. "Noise level" means the "A" weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty micronewtons per square meter. The unit of measure is the dB(A).

H. "Noncommercial purpose" means the use, operation, or maintenance of any sound amplifying equipment for other than a commercial purpose. "Noncommercial purpose" means and includes, but shall not be limited to, philanthropic, political, patriotic and charitable purposes.

I. "Person" means a person, firm, association, copartnership, joint venture, corporation, or any entity, public or private in nature.

J. "Sound amplifying equipment" means any machine or device for the amplification of the human voice, music, or any other sound. "Sound amplifying equipment" does not include standard automobile radios when used and heard only by the occupants of the vehicle in which the automobile radio is installed. "Sound amplifying equipment," as used in this chapter, does not include warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

K. "Sound level meter" means an instrument meeting American National Standard Institute's Standard S1.4-1971 for Type 1 or Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

L. "Sound pressure level," in decibels, of a sound means twenty times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure, which reference pressure shall be explicitly stated.

M. "Sound truck" means any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon, or attached thereto, any sound amplifying equipment.

(Ord. 297 § 1(part), 1976: prior code § 4801).

9.28.030 - Ambient base noise levels designated—Proof of violation.

A. Where the ambient noise level is less than designated in this section, the ambient base noise level in this section shall govern.

| Zone | Ambient Base Noise Level | |
|---|---|---|
| | 10 p.m. to 7 a.m. | 7 a.m. to 10 p.m. |
| Residential | 45 | 50 |
| Commercial | 50 | 55 |
| Industrial | 60 | 70 |

B. Any noise at a level which exceeds the ambient or the ambient base level as set forth in subsection A of this section, whichever is greater, by more than ten

dB when measured at any boundary line of the property from which the noise emanates shall constitute sufficient proof of a violation.

(Ord. 297 § 1(part), 1976: prior code § 4803).

9.28.040 - Noise level violation designated.

It is unlawful for any person to wilfully make or continue, or cause to be made or continued any noise at a level which exceeds by more than five dB the ambient or the ambient base level as set forth in Section 9.28.030, whichever is greater, when measured at any boundary line of the property from which the noise emanates.

(Ord. 297 § 1(part), 1976: prior code § 4804).

9.28.050 - Radios, television sets and similar devices.

It is unlawful for any person within any residential zone of the city to use or operate any radio receiving set, musical instrument, phonograph, television set or other machine or device for the producing or reproducing of sound in a manner which would constitute a violation of Section 9.28.040.

(Ord. 297 § 1(part), 1976: prior code § 4820).

9.28.060 - Hawkers and peddlers.

It is unlawful for any person within the city to sell anything by outcry within any area of the city zones for residential uses.

(Ord. 297 § 1 (part), 1976: prior code § 4821).

9.28.070 - Drums.

It is unlawful for any person to use any drum or other instrument or device of any kind for the purpose of attracting attention for commercial purposes by the creation of noise within the city. This section shall not apply to any person who is a participant in a duly authorized parade or who has been otherwise duly authorized to engage in such conduct.

(Ord. 297 § 1(part), 1976: prior code § 4822).

9.28.080 - Schools and churches.

It is unlawful for any person to create any noise on any street, sidewalk or public place adjacent to any school, institution of learning, or church while the same is in use, if such noise unreasonably interferes with the working of such institution or would constitute a violation of Section 9.28.040.

(Ord. 297 § 1(part), 1976: prior code § 4823).

9.28.090 - Animals and fowl.

No person shall keep or maintain, or permit the keeping of, upon any premises owned, occupied or controlled by such person, any animal or fowl otherwise permitted to be kept which, by any sound, cry, or behavior, shall cause noise in any residential neighborhood which would constitute a violation of Section 9.28.040, or otherwise constitute a nuisance.

(Ord. 297 § 1(part), 1976: prior code § 4824).

9.28.100 - Machinery, equipment, fans, and air conditioning.

It is unlawful for any person to operate any machinery, equipment, pump, fan, air-conditioning apparatus, or similar mechanical device in any manner so as to create any noise which would cause the noise level at any boundary line of any property from which such noise emanates to exceed the ambient noise level or the ambient base level as set forth in Section 9.28.030, whichever is greater, by more than ten decibels; provided, however, this section shall not prevent the reasonable operation of customary household gardening equipment or hobby shop equipment during the hours of eight a.m. to nine p.m., Monday through Saturday, and ten a.m. to eight p.m. on Sunday, provided the same may not exceed eighty decibels (as measured from the adjacent property line) for more than three hours from sunup to sundown.

(Ord. 297 § 1(part), 1976: prior code § 4825).

9.28.110 - Construction of building and projects—Times specified.

A. It is unlawful for any person within a residential zone, or within a radius of five hundred feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to operate any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other construction type device on a development requiring a city permit, in such a manner that noise is produced which would constitute a violation of Section 9.28.040, unless beforehand authorization therefor has been duly obtained from the building inspector. Such activity is unlawful without a permit during all hours on Sunday. No permit shall be required to perform emergency work as defined in subsection E of 9.28.020.

B. Construction authorized by subsection A of this section shall be limited to seven a.m. to seven p.m.

(Ord. 297 § 1(part), 1976: prior code § 4830).

9.28.120 - Industry and racetracks.

The noise level from industrial plants, auto wreckers, junkyards, racetracks or other industrial user shall not exceed the levels set forth in Section 9.28.040, except as may be specifically authorized by permit from the city.

(Ord. 297 § 1(part), 1976: prior code § 4860).

9.28.130 - Vehicle repairs.

It is unlawful for any person within any residential area of the city to repair, rebuild or test any motor vehicle thereby producing noise which would constitute a violation of Section 9.28.040.

(Ord. 297 § 1 (part), 1976: prior code § 4840).

9.28.140 - Motor-driven vehicles.

It is unlawful for any person to operate any motor-driven vehicle within the city in such a manner producing noise which would constitute a violation of Section 9.28.040.

(Ord. 297 § 1(part), 1976: prior code § 4841).

9.28.150 - Amplified sound—Purpose of provisions.

The council enacts this legislation for the sole purpose of securing and promoting the public health, comfort, safety and welfare for its citizenry. While recognizing that the use of sound amplifying equipment for certain purposes is protected by the constitutional rights of freedom of speech and assembly, the council nevertheless feels obligated to reasonably regulate the use of sound amplifying equipment in order to protect the correlative constitutional rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise.

(Ord. 297 § 1(part), 1976: prior code § 4850).

9.28.160 - Amplified sound—Commercial use prohibited.

It is unlawful for any person to install, use, or operate within the city for commercial purposes, a loudspeaker or sound amplifying equipment in a fixed or movable position or mounted upon an.y sound truck.

(Ord. 297 § 1(part), 1976: prior code § 4851).

9.28.170 - Amplified sound—Registration statement—Required.

It is unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use or operate within the city for noncommercial purposes a loudspeaker or sound amplifying equipment in a fixed or movable position or mounted upon any sound truck for the purposes of giving instructions, directions, talks, addresses, lectures or transmitting music to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place or public property without first filing a registration statement and obtaining approval thereof, as set forth in Section 9.28.180.

(Ord. 297 § 1(part), 1976: prior code § 4852).

9.28.180 - Amplified sound—Registration statement—Filing—Approval—Disapproval—Revocation.

A. Filing. Every user of sound amplifying equipment for noncommercial purposes shall file a registration statement with the chief of police ten days prior to the date on which the sound amplifying equipment is intended to be used, which statement shall contain the following information:

1. The name, address and telephone number of both the owner and user of the sound amplifying equipment;
2. The maximum sound producing power of the sound amplifying equipment which shall include the wattage to be used, the volume in decibels of sound which will be produced, and the approximate distance for which sound will be audible from the sound amplifying equipment;
3. The license and motor number if a sound truck is to be used;
4. A general description of the sound amplifying equipment which is to be used; and
5. The nature of the use of the sound amplifying equipment proposed to be used for noncommercial purposes.

B. Approval. The chief of police shall return to the applicant an approved certified copy of the registration statement unless he finds that:

1. The conditions of the motor vehicle movement are such that in the opinion of the chief of police, use of the equipment would constitute a detriment to traffic safety; or
2. The conditions of pedestrian movement are such that use of the equipment would constitute a detriment to traffic safety; or
3. The registration statement required reveals that the applicant would violate the provisions set forth in Section 9.28.150, or any other provisions of this code.

C. Disapproval. In the event the registration statement is disapproved, the chief of police shall endorse upon the statement his reasons for disapproval and return it forthwith to the applicant.

D. Revocation. Any such permit may be revoked for violation of Section 9.28.150.

(Ord. 297 § 1(part), 1976: prior code § 4853).

9.28.190 - Amplified sound—Appeals.

Any person aggrieved by disapproval of a registration statement may file an appeal to the city council within ten days of the date of disapproval. The city council shall decide the appeal at its next meeting.

(Ord. 297 § 1(part), 1976: prior code § 4854).

9.28.200 - Amplified sound—Regulations of noncommercial use.

The noncommercial use of sound amplifying equipment shall be subject to the following regulations:

A. The only sound permitted shall be either music or human speech or both.
B. The operation of sound amplifying equipment shall only occur between the hours of eight a.m. and six p.m. each day except on Sundays and legal holidays. The operation of sound amplifying equipment on Sundays and legal holidays shall only occur between the hours of ten a.m. and six p.m.
C. No sound emanating from sound amplifying equipment shall exceed fifteen dB above the ambient as measured at any property line.
D. Notwithstanding the provisions of subsection C of this section, sound amplifying equipment shall not be operated within two hundred feet of churches, schools, or city or county buildings, except by special permit.
E. In any event, the volume of sound shall be so controlled that it will not be unreasonably loud, raucous, jarring, disturbing or a nuisance to reasonable persons of normal sensitiveness within the area of audibility.

(Ord. 297 § 1(part), 1976: prior code § 4855).

9.28.210 - Excessive noise prohibited.

Notwithstanding any other provision of this chapter, it is unlawful for any person to wilfully make or continue, or cause to be made or continued, any loud, unnecessary, or unusual noise which disturbs the peace or quiet of any neighborhood.

(Ord. 297 § 1(part), 1976: prior code § 4870).

9.28.220 - Standards for determining violation of Section 9.28.210.

The standards which may be considered in determining whether a violation of the provisions of Section 9.28.210 exists shall include, but not be limited to, the following:

A. The loudness of the noise;
B. The intensity of the noise;
C. Whether the nature of the noise is usual or unusual;
D. Whether the origin of the noise is natural or unnatural;
E. The loudness and intensity of the background noise, if any;
F. The proximity of the noise to residential sleeping facilities;
G. The nature and zoning of the area within which the noise emanates;
H. The density of the inhabitation of the area within which the noise emanates;
I. The time of the day or night the noise occurs;
J. The duration of the noise;
K. Whether the noise is recurrent, intermittent, or continuous; and
L. Whether the noise is produced by a commercial or residential activity.

(Ord. 297 § 1(part), 1976: prior code § 4871).

9.28.230 - Exclusions to chapter applicability.

The provisions of this chapter shall not apply to:

A. Sound produced by motor vehicles as regulated by sound limitation provisions of the California Vehicle Code when such vehicle is located or operated on any public street, right-of-way or highway;
B. Aircraft operated in conformity with federal law;
C. Public and private schools, organized activities including sports, carnivals, assemblies and other regular activities;
D. Construction, operation, maintenance and repairs of equipment, apparatus or facilities of park and recreation departments, public works projects or essential public services and facilities, including those of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission;
E. Activities of the federal, state or local government;
F. Any noise continuing for less than thirty seconds at intervals greater than once in three hours.

(Ord. 297 § 1(part), 1976: prior code § 4880).

9.28.240 - Effect of chapter.

Nothing in this chapter shall authorize any use otherwise prohibited or regulated by this code.

(Ord. 297 § 1(part), 1976: prior code § 4808).

9.28.250 - Noise level enforcement criteria.

Enforcement of the provisions of this chapter shall be based on a noise level measurement to establish the noise level. The measurement shall be taken in accordance with the city's administrative instruction concerning noise level measurement procedure.

(Ord. 297 § 1(part), 1976: prior code § 4802).

9.28.251 - Residential parties—Publicized commercialism regulated.

A. Definitions. For the purpose of this section:

1. "Major party" means a group of more than fifty persons meeting together for social, recreational or amusement purposes, but excluding meetings for political, charitable or religious purposes.
2. "Residence" means:
    a. any property used for residential use; and
    b. any property situated in any of the residential zones as defined and zoned in the zoning code of this city.
3. "Publicized" means an open invitation circulated by flyer or advertised by publication, posting or distribution in or about public places suggesting unlimited or unreserved attendance.
4. "Commercial" means the suggestion or request of a monetary charge for admission.
5. "Permit" means a permit issued by either the city council, city manager or police chief. Such permit shall be issued upon application unless the issuer finds that such party will (or is likely to) cause problems relating to traffic, overcrowding, noise, hours after eleven p.m. or other matters affecting residential quality of life. Such permits may also contain appropriate conditions.

B. It is unlawful to have or permit a publicized commercial major party in a residence in this city without a permit or other than in compliance with such permit.

C. violation of this section is punishable by a fine not to exceed five hundred dollars or by imprisonment for not to exceed six months, or by both such fine and imprisonment.

(Ord. 408 § 1, 1986: Ord. 366 § 1, 1983).

9.28.260 - Violations—Penalties.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be fined in an amount not exceeding five hundred dollars or be imprisoned in the county jail for a period not exceeding six months, or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

(Ord. 297 § 1(part), 1976: prior code § 4805).

9.28.270 - Violations—Additional remedies—Injunctions.

As an additional remedy, the operation or maintenance of any device, instrument, vehicle, or machinery in violation of any provision of this chapter shall be deemed, and is declared to be, a public nuisance and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

(Ord. 297 § 1(part), 1976: prior code § 4806).

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# APPENDIX 5.1:

# STUDY AREA PHOTOS

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L1 E
34, 6' 52.260000", 118, 0' 23.870000"

L1 N
34, 6' 52.410000", 118, 0' 23.980000"

L1 S
34, 6' 52.290000", 118, 0' 23.870000"

L1 W
34, 6' 52.280000", 118, 0' 23.870000"

L2 E
34, 7' 16.870000", 117, 59' 14.130000"

L2 N
34, 7' 16.870000", 117, 59' 14.130000"

L2 S
34, 7' 16.870000", 117, 59' 14.130000"

L2 W
34, 7' 16.760000", 117, 59' 13.990000"

L3 E
34, 7' 43.860000", 117, 58' 41.640000"

L3 N
34, 7' 43.990000", 117, 58' 41.610000"

L3 S
34, 7' 43.860000", 117, 58' 41.640000"

L3 W
34, 7' 43.970000", 117, 58' 41.610000"

L4 E
34, 6' 48.270000", 117, 57' 28.360000"

L4 N
34, 6' 48.270000", 117, 57' 28.330000"

L4 S
34, 6' 48.380000", 117, 57' 28.390000"

L4 W
34, 6' 48.380000", 117, 57' 28.390000"

L5 E
34, 6' 20.960000", 117, 57' 59.860000"


L5 N
34, 6' 20.960000", 117, 57' 59.860000"

L5 S
34, 6' 20.980000", 117, 57' 59.860000"

L5 W
34, 6' 20.960000", 117, 57' 59.840000"

L6 E
34, 5' 52.870000", 117, 58' 41.640000"

L6 N
34, 5' 52.610000", 117, 58' 41.940000"

L6 S
34, 5' 52.830000", 117, 58' 41.720000"

L6 W
34, 5' 52.390000", 117, 58' 41.420000"

L7 E
34, 5' 52.760000", 117, 59' 52.200000"

L7 N
34, 5' 52.730000", 117, 59' 52.250000"

L7 S
34, 5' 52.760000", 117, 59' 52.170000"

L7 W
34, 5' 52.740000", 117, 59' 52.170000"


L8 E
34, 6' 42.150000", 117, 59' 19.870000"

L8 N
34, 6' 42.260000", 117, 59' 19.740000"

L8 S
34, 6' 42.280000", 117, 59' 19.740000"

L8 W
34, 6' 42.280000", 117, 59' 19.740000"

# APPENDIX 5.2:

# NOISE LEVEL MEASUREMENT WORKSHEETS

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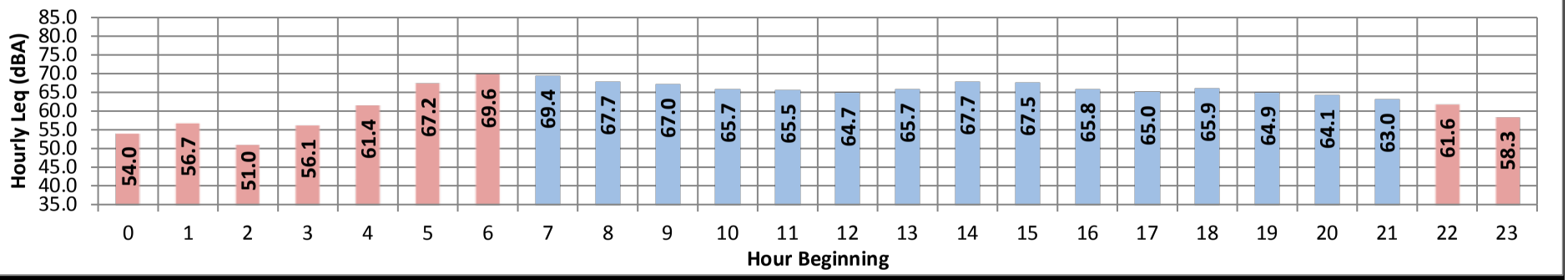
# 24-Hour Noise Level Measurement Summary

| | | | | Energy Average Leq | | 24-Hour |
|---|---|---|---|---|---|---|
| *Project Name:* | The Park at Live Oak | *JN:* | 11112 | *Day* | *Night* | *CNEL* |
| *Location:* | L1- Located on Longden Avenue west of the Project adjacent to Longden Avenue Park, Plymouth Elementary School, and existing residential homes. | *Analyst:* | A. Wolfe | 66.3 | 63.3 | 70.5 |
| | | *Date:* | 8/24/2017 | | | |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 63.0 | 78.4 | 41.2 | 73.0 | 71.0 | 70.0 | 69.0 | 61.0 | 50.0 | 44.0 | 43.0 | 42.0 |
| | Max | 69.4 | 87.4 | 48.1 | 76.0 | 75.0 | 74.0 | 73.0 | 71.0 | 67.0 | 56.0 | 53.0 | 50.0 |
| Energy Average: | | 66.3 | Average: | | 74.1 | 73.0 | 71.5 | 70.5 | 66.3 | 60.1 | 48.7 | 46.7 | 44.7 |
| Night | Min | 51.0 | 74.3 | 35.5 | 65.0 | 60.0 | 48.0 | 42.0 | 38.0 | 38.0 | 35.0 | 35.0 | 35.0 |
| | Max | 69.6 | 82.9 | 41.9 | 76.0 | 75.0 | 74.0 | 73.0 | 71.0 | 67.0 | 51.0 | 48.0 | 44.0 |
| Energy Average: | | 63.3 | Average: | | 71.3 | 68.8 | 64.0 | 60.3 | 50.7 | 45.6 | 39.7 | 38.9 | 38.1 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 54.0 | 78.1 | 35.5 | 68.0 | 64.0 | 56.0 | 50.0 | 40.0 | 38.0 | 35.0 | 35.0 | 35.0 |
| | 1 | 56.7 | 80.0 | 35.5 | 70.0 | 67.0 | 61.0 | 56.0 | 40.0 | 38.0 | 35.0 | 35.0 | 35.0 |
| | 2 | 51.0 | 74.3 | 35.5 | 65.0 | 60.0 | 48.0 | 42.0 | 38.0 | 38.0 | 35.0 | 35.0 | 35.0 |
| | 3 | 56.1 | 77.5 | 35.5 | 70.0 | 67.0 | 61.0 | 56.0 | 40.0 | 38.0 | 37.0 | 35.0 | 35.0 |
| | 4 | 61.4 | 77.4 | 38.4 | 73.0 | 71.0 | 69.0 | 67.0 | 57.0 | 44.0 | 38.0 | 38.0 | 38.0 |
| | 5 | 67.2 | 82.9 | 40.0 | 75.0 | 74.0 | 73.0 | 72.0 | 68.0 | 59.0 | 42.0 | 41.0 | 40.0 |
| | 6 | 69.6 | 82.8 | 41.9 | 76.0 | 75.0 | 74.0 | 73.0 | 71.0 | 67.0 | 51.0 | 48.0 | 44.0 |
| Day | 7 | 69.4 | 87.2 | 41.2 | 76.0 | 75.0 | 74.0 | 73.0 | 71.0 | 67.0 | 52.0 | 47.0 | 42.0 |
| | 8 | 67.7 | 83.2 | 43.7 | 76.0 | 75.0 | 73.0 | 72.0 | 69.0 | 62.0 | 50.0 | 49.0 | 45.0 |
| | 9 | 67.0 | 87.4 | 44.0 | 75.0 | 74.0 | 73.0 | 71.0 | 67.0 | 59.0 | 47.0 | 46.0 | 45.0 |
| | 10 | 65.7 | 84.1 | 42.3 | 75.0 | 73.0 | 72.0 | 71.0 | 65.0 | 57.0 | 45.0 | 44.0 | 42.0 |
| | 11 | 65.5 | 81.1 | 42.8 | 74.0 | 73.0 | 71.0 | 70.0 | 66.0 | 59.0 | 46.0 | 44.0 | 43.0 |
| | 12 | 64.7 | 79.9 | 42.0 | 73.0 | 72.0 | 70.0 | 69.0 | 65.0 | 58.0 | 46.0 | 44.0 | 43.0 |
| | 13 | 65.7 | 79.5 | 42.5 | 73.0 | 72.0 | 71.0 | 70.0 | 67.0 | 62.0 | 48.0 | 46.0 | 44.0 |
| | 14 | 67.7 | 85.8 | 44.3 | 75.0 | 74.0 | 72.0 | 72.0 | 68.0 | 65.0 | 53.0 | 50.0 | 46.0 |
| | 15 | 67.5 | 80.4 | 48.1 | 75.0 | 74.0 | 73.0 | 72.0 | 68.0 | 64.0 | 56.0 | 53.0 | 50.0 |
| | 16 | 65.8 | 86.4 | 47.1 | 73.0 | 72.0 | 70.0 | 69.0 | 66.0 | 62.0 | 54.0 | 52.0 | 50.0 |
| | 17 | 65.0 | 82.5 | 45.0 | 73.0 | 71.0 | 70.0 | 69.0 | 65.0 | 62.0 | 52.0 | 50.0 | 48.0 |
| | 18 | 65.9 | 80.9 | 42.6 | 74.0 | 73.0 | 71.0 | 70.0 | 67.0 | 61.0 | 48.0 | 45.0 | 43.0 |
| | 19 | 64.9 | 78.4 | 42.4 | 74.0 | 73.0 | 71.0 | 70.0 | 65.0 | 58.0 | 45.0 | 44.0 | 43.0 |
| | 20 | 64.1 | 79.6 | 42.4 | 73.0 | 72.0 | 71.0 | 70.0 | 64.0 | 56.0 | 44.0 | 43.0 | 43.0 |
| | 21 | 63.0 | 80.8 | 42.2 | 73.0 | 72.0 | 70.0 | 69.0 | 61.0 | 50.0 | 44.0 | 43.0 | 43.0 |
| Night | 22 | 61.6 | 80.3 | 41.4 | 73.0 | 72.0 | 69.0 | 67.0 | 56.0 | 46.0 | 43.0 | 43.0 | 41.0 |
| | 23 | 58.3 | 77.1 | 40.1 | 72.0 | 69.0 | 65.0 | 60.0 | 46.0 | 42.0 | 41.0 | 40.0 | 40.0 |

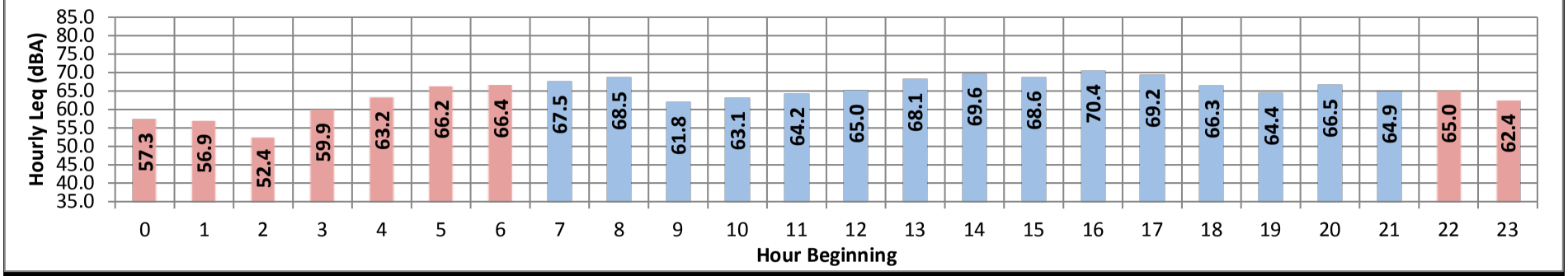


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | Energy Average Leq | | 24-Hour |
|---|---|---|---|---|---|
| *Project Name:* The Park at Live Oak | *JN:* 11112 | | *Day* | *Night* | *CNEL* |
| *Location:* L2- Located north of the Project site on Meridian Street near existing residential homes and industrial uses. | *Analyst:* A. Wolfe | | 67.2 | 62.9 | 70.6 |
| | *Date:* 8/24/2017 | | | | |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 61.8 | 84.7 | 44.2 | 72.0 | 70.0 | 67.0 | 65.0 | 59.0 | 52.0 | 47.0 | 46.0 | 45.0 |
| | Max | 70.4 | 97.8 | 51.2 | 81.0 | 78.0 | 75.0 | 73.0 | 69.0 | 65.0 | 55.0 | 55.0 | 53.0 |
| Energy Average: | | 67.2 | Average: | | 77.3 | 74.0 | 69.7 | 67.9 | 62.7 | 57.1 | 49.7 | 48.7 | 47.1 |
| Night | Min | 52.4 | 76.4 | 40.7 | 63.0 | 60.0 | 55.0 | 52.0 | 47.0 | 46.0 | 44.0 | 43.0 | 41.0 |
| | Max | 66.4 | 90.9 | 52.7 | 77.0 | 74.0 | 71.0 | 70.0 | 66.0 | 63.0 | 61.0 | 60.0 | 54.0 |
| Energy Average: | | 62.9 | Average: | | 70.1 | 67.9 | 64.2 | 62.3 | 57.7 | 54.3 | 48.4 | 47.4 | 45.3 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 57.3 | 80.6 | 44.5 | 66.0 | 64.0 | 59.0 | 59.0 | 58.0 | 55.0 | 48.0 | 47.0 | 46.0 |
| | 1 | 56.9 | 86.6 | 41.3 | 66.0 | 64.0 | 58.0 | 55.0 | 50.0 | 49.0 | 45.0 | 44.0 | 42.0 |
| | 2 | 52.4 | 77.3 | 40.7 | 63.0 | 60.0 | 55.0 | 52.0 | 47.0 | 46.0 | 44.0 | 43.0 | 41.0 |
| | 3 | 59.9 | 85.2 | 40.8 | 71.0 | 68.0 | 64.0 | 60.0 | 53.0 | 48.0 | 44.0 | 44.0 | 42.0 |
| | 4 | 63.2 | 88.3 | 42.1 | 74.0 | 71.0 | 67.0 | 65.0 | 57.0 | 52.0 | 45.0 | 44.0 | 43.0 |
| | 5 | 66.2 | 90.9 | 42.7 | 77.0 | 74.0 | 70.0 | 68.0 | 62.0 | 55.0 | 45.0 | 44.0 | 43.0 |
| | 6 | 66.4 | 88.8 | 45.4 | 75.0 | 73.0 | 71.0 | 70.0 | 66.0 | 62.0 | 51.0 | 49.0 | 47.0 |
| Day | 7 | 67.5 | 91.7 | 46.1 | 76.0 | 74.0 | 71.0 | 69.0 | 66.0 | 61.0 | 50.0 | 48.0 | 47.0 |
| | 8 | 68.5 | 87.7 | 46.6 | 78.0 | 77.0 | 75.0 | 73.0 | 68.0 | 62.0 | 51.0 | 50.0 | 47.0 |
| | 9 | 61.8 | 84.7 | 45.5 | 72.0 | 70.0 | 67.0 | 65.0 | 59.0 | 52.0 | 47.0 | 47.0 | 46.0 |
| | 10 | 63.1 | 85.0 | 44.4 | 75.0 | 72.0 | 68.0 | 66.0 | 59.0 | 52.0 | 47.0 | 46.0 | 45.0 |
| | 11 | 64.2 | 87.3 | 44.9 | 76.0 | 72.0 | 68.0 | 66.0 | 59.0 | 53.0 | 47.0 | 46.0 | 45.0 |
| | 12 | 65.0 | 92.5 | 44.2 | 74.0 | 72.0 | 68.0 | 66.0 | 60.0 | 53.0 | 47.0 | 46.0 | 45.0 |
| | 13 | 68.1 | 91.6 | 44.7 | 81.0 | 77.0 | 71.0 | 68.0 | 62.0 | 55.0 | 48.0 | 47.0 | 45.0 |
| | 14 | 69.6 | 97.8 | 45.5 | 80.0 | 77.0 | 71.0 | 69.0 | 63.0 | 57.0 | 49.0 | 48.0 | 46.0 |
| | 15 | 68.6 | 91.2 | 47.6 | 81.0 | 76.0 | 71.0 | 69.0 | 65.0 | 60.0 | 51.0 | 50.0 | 48.0 |
| | 16 | 70.4 | 96.4 | 48.7 | 81.0 | 78.0 | 73.0 | 71.0 | 67.0 | 63.0 | 54.0 | 52.0 | 50.0 |
| | 17 | 69.2 | 89.7 | 48.3 | 79.0 | 76.0 | 73.0 | 72.0 | 69.0 | 65.0 | 54.0 | 52.0 | 49.0 |
| | 18 | 66.3 | 89.4 | 46.6 | 79.0 | 75.0 | 69.0 | 67.0 | 61.0 | 56.0 | 49.0 | 48.0 | 47.0 |
| | 19 | 64.4 | 88.3 | 45.0 | 76.0 | 72.0 | 67.0 | 66.0 | 60.0 | 52.5 | 47.0 | 47.0 | 46.0 |
| | 20 | 66.5 | 91.9 | 46.1 | 76.0 | 71.0 | 67.0 | 65.0 | 61.0 | 57.0 | 49.0 | 49.0 | 47.0 |
| | 21 | 64.9 | 90.8 | 51.2 | 75.0 | 71.0 | 67.0 | 67.0 | 61.0 | 58.0 | 55.0 | 55.0 | 53.0 |
| Night | 22 | 65.0 | 90.9 | 52.7 | 71.0 | 69.0 | 66.0 | 65.0 | 64.0 | 63.0 | 61.0 | 60.0 | 54.0 |
| | 23 | 62.4 | 76.4 | 44.0 | 68.0 | 68.0 | 68.0 | 67.0 | 62.0 | 59.0 | 53.0 | 52.0 | 50.0 |

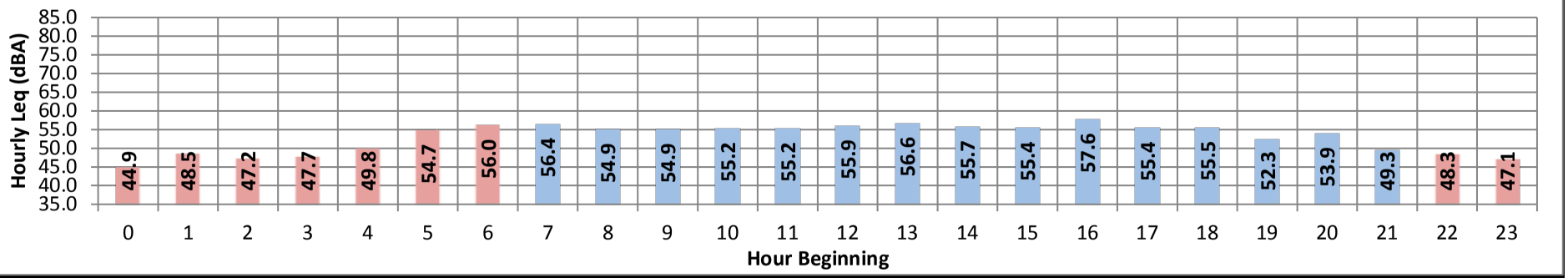


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | | | |
|---|---|---|---|---|---|
| *Project Name:* The Park at Live Oak | *JN:* 11112 | *Energy Average Leq* | | *24-Hour* |
| | *Analyst:* A. Wolfe | *Day* | *Night* | *CNEL* |
| *Location:* L3- Located north of the Project site on Kellwil Way near existing residential homes and Beardslee Elementary School. | *Date:* 8/24/2017 | 55.3 | 51.0 | 58.6 |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 49.3 | 66.6 | 43.2 | 59.0 | 56.0 | 53.0 | 52.0 | 48.0 | 46.0 | 44.0 | 44.0 | 44.0 |
| | Max | 57.6 | 81.6 | 49.1 | 65.0 | 63.0 | 61.0 | 60.0 | 56.0 | 54.0 | 51.0 | 51.0 | 50.0 |
| Energy Average: | | 55.3 | Average: | | 63.5 | 61.5 | 59.1 | 57.9 | 54.1 | 51.7 | 48.5 | 47.9 | 47.1 |
| Night | Min | 44.9 | 63.7 | 39.5 | 53.0 | 50.0 | 47.0 | 45.0 | 44.0 | 43.0 | 41.0 | 40.0 | 40.0 |
| | Max | 56.0 | 78.9 | 44.0 | 65.0 | 63.0 | 61.0 | 59.0 | 55.0 | 52.0 | 47.0 | 45.0 | 44.0 |
| Energy Average: | | 51.0 | Average: | | 58.8 | 55.6 | 52.4 | 50.2 | 47.0 | 45.1 | 42.8 | 41.9 | 41.5 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 44.9 | 63.7 | 39.5 | 53.0 | 50.0 | 47.0 | 46.0 | 44.0 | 43.0 | 41.0 | 40.0 | 40.0 |
| | 1 | 48.5 | 70.0 | 40.6 | 60.0 | 53.0 | 47.0 | 45.0 | 44.0 | 43.0 | 42.0 | 42.0 | 41.0 |
| | 2 | 47.2 | 68.6 | 40.1 | 56.0 | 53.0 | 49.0 | 47.0 | 45.0 | 44.0 | 41.0 | 40.0 | 40.0 |
| | 3 | 47.7 | 69.2 | 42.1 | 56.0 | 53.0 | 51.0 | 48.0 | 46.0 | 45.0 | 43.0 | 43.0 | 43.0 |
| | 4 | 49.8 | 68.7 | 41.1 | 61.0 | 58.0 | 55.0 | 52.0 | 46.0 | 44.0 | 42.0 | 41.0 | 41.0 |
| | 5 | 54.7 | 78.9 | 41.9 | 64.0 | 62.0 | 59.0 | 56.0 | 51.0 | 46.0 | 44.0 | 43.0 | 42.0 |
| | 6 | 56.0 | 73.6 | 44.0 | 65.0 | 63.0 | 61.0 | 59.0 | 55.0 | 52.0 | 47.0 | 45.0 | 44.0 |
| Day | 7 | 56.4 | 73.8 | 45.8 | 65.0 | 63.0 | 61.0 | 60.0 | 56.0 | 53.0 | 50.0 | 49.0 | 47.0 |
| | 8 | 54.9 | 71.9 | 46.1 | 64.0 | 62.0 | 60.0 | 58.0 | 54.0 | 51.0 | 48.0 | 47.0 | 46.0 |
| | 9 | 54.9 | 73.6 | 46.1 | 64.0 | 61.0 | 59.0 | 58.0 | 54.0 | 52.0 | 49.0 | 48.0 | 47.0 |
| | 10 | 55.2 | 72.0 | 47.3 | 64.0 | 62.0 | 60.0 | 59.0 | 54.0 | 51.0 | 49.0 | 49.0 | 48.0 |
| | 11 | 55.2 | 68.7 | 48.0 | 63.0 | 62.0 | 60.0 | 58.0 | 55.0 | 53.0 | 50.0 | 49.0 | 49.0 |
| | 12 | 55.9 | 72.6 | 48.0 | 64.0 | 62.0 | 60.0 | 59.0 | 55.0 | 53.0 | 50.0 | 49.0 | 48.0 |
| | 13 | 56.6 | 74.3 | 49.1 | 64.0 | 62.0 | 60.0 | 59.0 | 56.0 | 54.0 | 51.0 | 51.0 | 50.0 |
| | 14 | 55.7 | 71.6 | 47.3 | 64.0 | 63.0 | 60.0 | 59.0 | 55.0 | 53.0 | 49.0 | 49.0 | 48.0 |
| | 15 | 55.4 | 71.3 | 46.0 | 64.0 | 62.0 | 60.0 | 59.0 | 55.0 | 52.0 | 48.0 | 47.0 | 47.0 |
| | 16 | 57.6 | 81.6 | 46.4 | 65.0 | 63.0 | 61.0 | 60.0 | 56.0 | 54.0 | 50.0 | 49.0 | 48.0 |
| | 17 | 55.4 | 71.4 | 47.4 | 63.0 | 61.0 | 59.0 | 58.0 | 55.0 | 53.0 | 50.0 | 50.0 | 49.0 |
| | 18 | 55.5 | 75.9 | 45.1 | 64.0 | 62.0 | 59.0 | 58.0 | 55.0 | 53.0 | 49.0 | 48.0 | 47.0 |
| | 19 | 52.3 | 69.1 | 43.2 | 62.0 | 60.0 | 57.0 | 55.0 | 52.0 | 49.0 | 45.0 | 45.0 | 44.0 |
| | 20 | 53.9 | 78.4 | 44.2 | 63.0 | 61.0 | 58.0 | 56.0 | 51.0 | 48.0 | 45.0 | 45.0 | 45.0 |
| | 21 | 49.3 | 66.6 | 43.5 | 59.0 | 56.0 | 53.0 | 52.0 | 48.0 | 46.0 | 44.0 | 44.0 | 44.0 |
| Night | 22 | 48.3 | 67.3 | 41.2 | 58.0 | 55.0 | 52.0 | 50.0 | 47.0 | 45.0 | 43.0 | 42.0 | 41.0 |
| | 23 | 47.1 | 66.5 | 41.2 | 56.0 | 53.5 | 50.5 | 48.8 | 45.3 | 43.8 | 42.3 | 41.5 | 41.3 |



URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

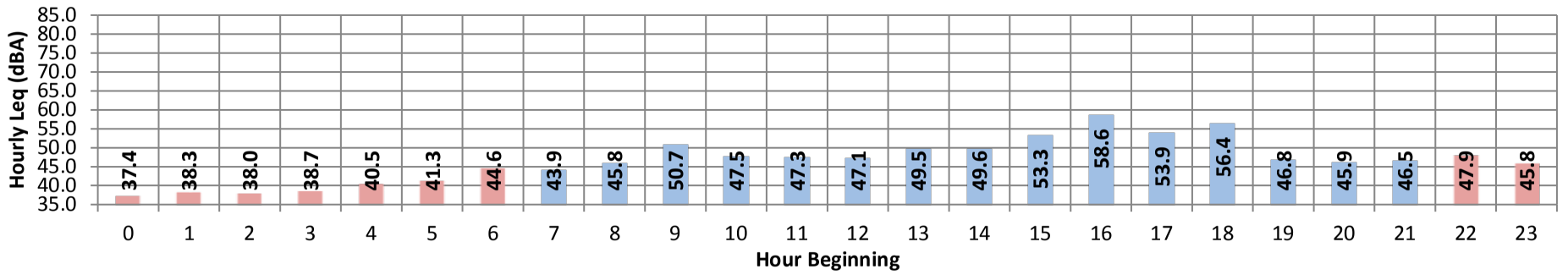
*Project Name:* The Park at Live Oak

*Location:* L4- Located in the Santa Fe Dam Recreation Area east of the Project site.

*JN:* 11112
*Analyst:* A. Wolfe
*Date:* 8/24/2017

| *Energy Average Leq* | | *24-Hour* |
|---|---|---|
| *Day* | *Night* | *CNEL* |
| 51.8 | 43.0 | 52.6 |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 43.9 | 58.9 | 39.0 | 52.0 | 50.0 | 46.0 | 45.0 | 42.0 | 41.0 | 39.0 | 39.0 | 39.0 |
| | Max | 58.6 | 89.0 | 43.8 | 65.0 | 62.0 | 58.0 | 57.0 | 52.0 | 47.0 | 45.0 | 45.0 | 44.0 |
| Energy Average: | | 51.8 | Average: | | 57.5 | 54.7 | 50.9 | 49.6 | 46.6 | 44.9 | 43.2 | 42.9 | 42.5 |
| Night | Min | 37.4 | 42.5 | 36.0 | 40.0 | 40.0 | 39.0 | 38.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| | Max | 47.9 | 77.2 | 41.6 | 56.0 | 53.0 | 49.0 | 46.0 | 45.0 | 44.0 | 43.0 | 43.0 | 42.0 |
| Energy Average: | | 43.0 | Average: | | 47.4 | 45.3 | 42.8 | 41.8 | 39.7 | 39.2 | 38.3 | 38.3 | 38.2 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 37.4 | 47.3 | 36.0 | 43.0 | 42.0 | 39.0 | 39.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| | 1 | 38.3 | 51.5 | 36.0 | 46.0 | 44.0 | 42.0 | 40.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| | 2 | 38.0 | 53.8 | 36.0 | 46.0 | 42.0 | 39.0 | 38.0 | 36.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| | 3 | 38.7 | 42.5 | 36.0 | 40.0 | 40.0 | 40.0 | 40.0 | 39.0 | 39.0 | 36.0 | 36.0 | 36.0 |
| | 4 | 40.5 | 56.9 | 38.8 | 46.0 | 42.0 | 40.0 | 40.0 | 39.0 | 39.0 | 39.0 | 39.0 | 39.0 |
| | 5 | 41.3 | 52.8 | 38.8 | 48.0 | 46.0 | 43.0 | 43.0 | 41.0 | 40.0 | 39.0 | 39.0 | 39.0 |
| | 6 | 44.6 | 61.4 | 39.6 | 54.0 | 53.0 | 49.0 | 46.0 | 42.0 | 41.0 | 40.0 | 40.0 | 40.0 |
| Day | 7 | 43.9 | 58.9 | 39.0 | 54.0 | 52.0 | 46.0 | 45.0 | 42.0 | 41.0 | 39.0 | 39.0 | 39.0 |
| | 8 | 45.8 | 65.1 | 40.7 | 54.0 | 51.0 | 48.0 | 47.0 | 44.0 | 43.0 | 42.0 | 42.0 | 41.0 |
| | 9 | 50.7 | 73.5 | 42.4 | 61.0 | 56.0 | 50.0 | 49.0 | 46.0 | 45.0 | 44.0 | 43.0 | 43.0 |
| | 10 | 47.5 | 63.5 | 43.7 | 54.0 | 53.0 | 51.0 | 50.0 | 47.0 | 45.0 | 44.0 | 44.0 | 44.0 |
| | 11 | 47.3 | 61.8 | 43.4 | 56.0 | 54.0 | 51.0 | 49.0 | 46.0 | 45.0 | 44.0 | 44.0 | 43.0 |
| | 12 | 47.1 | 62.1 | 42.8 | 57.0 | 54.0 | 49.0 | 48.0 | 46.0 | 45.0 | 43.0 | 43.0 | 43.0 |
| | 13 | 49.5 | 65.9 | 43.8 | 59.0 | 57.0 | 53.0 | 52.0 | 48.0 | 46.0 | 45.0 | 45.0 | 44.0 |
| | 14 | 49.6 | 80.4 | 42.6 | 57.0 | 54.0 | 50.0 | 49.0 | 47.0 | 46.0 | 44.0 | 43.0 | 43.0 |
| | 15 | 53.3 | 80.0 | 42.9 | 62.0 | 55.0 | 52.0 | 51.0 | 48.0 | 46.0 | 44.0 | 44.0 | 43.0 |
| | 16 | 58.6 | 89.0 | 42.0 | 65.0 | 62.0 | 58.0 | 57.0 | 52.0 | 47.0 | 44.0 | 43.0 | 43.0 |
| | 17 | 53.9 | 79.2 | 41.9 | 64.0 | 61.0 | 57.0 | 54.0 | 49.0 | 46.0 | 43.0 | 43.0 | 42.0 |
| | 18 | 56.4 | 87.2 | 41.9 | 60.0 | 57.0 | 52.0 | 50.0 | 46.0 | 45.0 | 43.0 | 43.0 | 42.0 |
| | 19 | 46.8 | 63.7 | 41.8 | 56.0 | 53.0 | 50.0 | 48.0 | 46.0 | 44.0 | 43.0 | 42.0 | 42.0 |
| | 20 | 45.9 | 59.2 | 42.0 | 52.0 | 50.0 | 48.0 | 47.0 | 46.0 | 44.0 | 43.0 | 43.0 | 43.0 |
| | 21 | 46.5 | 62.7 | 42.7 | 52.0 | 51.0 | 49.0 | 48.0 | 46.0 | 45.0 | 43.0 | 43.0 | 43.0 |
| Night | 22 | 47.9 | 77.2 | 41.6 | 48.0 | 47.0 | 46.0 | 45.0 | 45.0 | 44.0 | 43.0 | 43.0 | 42.0 |
| | 23 | 45.8 | 64.9 | 40.1 | 56.0 | 52.0 | 47.0 | 45.0 | 43.0 | 42.0 | 40.0 | 40.0 | 40.0 |

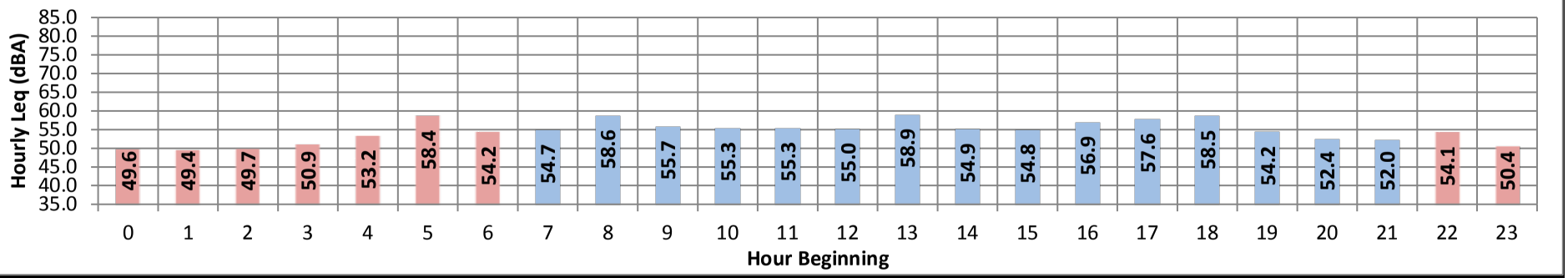


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | Energy Average Leq | | 24-Hour |
|---|---|---|---|---|---|
| *Project Name:* The Park at Live Oak | *JN:* 11112 | | *Day* | *Night* | *CNEL* |
| *Location:* L5- Located southeast of the Project adjacent to existing industrial uses on Live Oak Avenue and nearby residential homes. | *Analyst:* A. Wolfe | | 56.1 | 53.3 | 60.5 |
| | *Date:* 8/24/2017 | | | | |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 52.0 | 67.6 | 47.6 | 59.0 | 57.0 | 55.0 | 54.0 | 51.0 | 50.0 | 48.0 | 48.0 | 48.0 |
| | Max | 58.9 | 89.4 | 50.5 | 67.0 | 66.0 | 63.0 | 61.0 | 57.0 | 54.0 | 52.0 | 52.0 | 51.0 |
| Energy Average: | | 56.1 | Average: | | 62.9 | 60.9 | 58.4 | 57.2 | 54.4 | 52.5 | 50.3 | 49.8 | 49.3 |
| Night | Min | 49.4 | 62.4 | 46.8 | 54.0 | 53.0 | 51.0 | 50.0 | 48.0 | 48.0 | 47.0 | 47.0 | 47.0 |
| | Max | 58.4 | 80.4 | 47.9 | 70.0 | 65.0 | 61.0 | 59.0 | 55.0 | 52.0 | 49.0 | 48.0 | 48.0 |
| Energy Average: | | 53.3 | Average: | | 59.3 | 57.3 | 55.2 | 54.2 | 51.0 | 49.3 | 48.0 | 47.8 | 47.4 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 49.6 | 68.0 | 47.7 | 56.0 | 53.0 | 51.0 | 50.0 | 48.0 | 48.0 | 48.0 | 48.0 | 47.0 |
| | 1 | 49.4 | 62.4 | 47.9 | 54.0 | 53.0 | 51.0 | 50.0 | 49.0 | 48.0 | 48.0 | 48.0 | 48.0 |
| | 2 | 49.7 | 63.1 | 47.6 | 56.0 | 55.0 | 52.0 | 51.0 | 49.0 | 48.0 | 48.0 | 48.0 | 47.0 |
| | 3 | 50.9 | 69.0 | 46.8 | 58.0 | 57.0 | 55.0 | 54.0 | 50.0 | 48.0 | 47.0 | 47.0 | 47.0 |
| | 4 | 53.2 | 67.2 | 47.3 | 61.0 | 59.0 | 57.0 | 56.0 | 53.0 | 51.0 | 48.0 | 48.0 | 47.0 |
| | 5 | 58.4 | 80.4 | 47.6 | 70.0 | 65.0 | 61.0 | 59.0 | 55.0 | 52.0 | 49.0 | 48.0 | 48.0 |
| | 6 | 54.2 | 68.4 | 47.7 | 61.0 | 59.0 | 58.0 | 57.0 | 54.0 | 52.0 | 49.0 | 48.0 | 48.0 |
| Day | 7 | 54.7 | 68.3 | 47.9 | 62.0 | 60.0 | 58.0 | 57.0 | 54.0 | 53.0 | 50.0 | 49.0 | 48.0 |
| | 8 | 58.6 | 85.3 | 49.3 | 67.0 | 62.0 | 59.0 | 58.0 | 55.0 | 53.0 | 51.0 | 50.0 | 50.0 |
| | 9 | 55.7 | 72.4 | 49.2 | 65.0 | 62.0 | 60.0 | 58.0 | 55.0 | 52.0 | 50.0 | 50.0 | 49.0 |
| | 10 | 55.3 | 73.7 | 49.5 | 63.0 | 61.0 | 59.0 | 57.0 | 54.0 | 52.0 | 50.0 | 50.0 | 50.0 |
| | 11 | 55.3 | 71.3 | 48.7 | 63.0 | 62.0 | 59.0 | 58.0 | 55.0 | 53.0 | 50.0 | 50.0 | 49.0 |
| | 12 | 55.0 | 77.0 | 48.0 | 63.0 | 61.0 | 58.0 | 57.0 | 54.0 | 53.0 | 49.0 | 49.0 | 48.0 |
| | 13 | 58.9 | 89.4 | 49.1 | 64.0 | 62.0 | 59.0 | 58.0 | 55.0 | 53.0 | 51.0 | 50.0 | 49.0 |
| | 14 | 54.9 | 70.1 | 49.1 | 61.0 | 60.0 | 58.0 | 57.0 | 55.0 | 53.0 | 51.0 | 50.0 | 50.0 |
| | 15 | 54.8 | 67.6 | 50.0 | 60.0 | 59.0 | 57.0 | 57.0 | 55.0 | 53.0 | 52.0 | 51.0 | 51.0 |
| | 16 | 56.9 | 78.8 | 50.5 | 65.0 | 63.0 | 60.0 | 58.0 | 56.0 | 54.0 | 52.0 | 52.0 | 51.0 |
| | 17 | 57.6 | 86.6 | 48.7 | 64.0 | 62.0 | 59.0 | 58.0 | 55.0 | 53.0 | 51.0 | 50.0 | 50.0 |
| | 18 | 58.5 | 79.9 | 49.1 | 67.0 | 66.0 | 63.0 | 61.0 | 57.0 | 54.0 | 51.0 | 50.0 | 49.0 |
| | 19 | 54.2 | 74.2 | 48.8 | 62.0 | 59.0 | 57.0 | 56.0 | 53.0 | 52.0 | 50.0 | 49.0 | 49.0 |
| | 20 | 52.4 | 73.0 | 48.0 | 59.0 | 58.0 | 55.0 | 54.0 | 52.0 | 50.0 | 49.0 | 49.0 | 48.0 |
| | 21 | 52.0 | 72.2 | 47.6 | 59.0 | 57.0 | 55.0 | 54.0 | 51.0 | 50.0 | 48.0 | 48.0 | 48.0 |
| Night | 22 | 54.1 | 68.3 | 47.6 | 60.0 | 60.0 | 59.0 | 59.0 | 52.0 | 49.0 | 48.0 | 48.0 | 48.0 |
| | 23 | 50.4 | 66.0 | 47.3 | 58.0 | 55.0 | 53.0 | 52.0 | 49.0 | 48.0 | 47.0 | 47.0 | 47.0 |

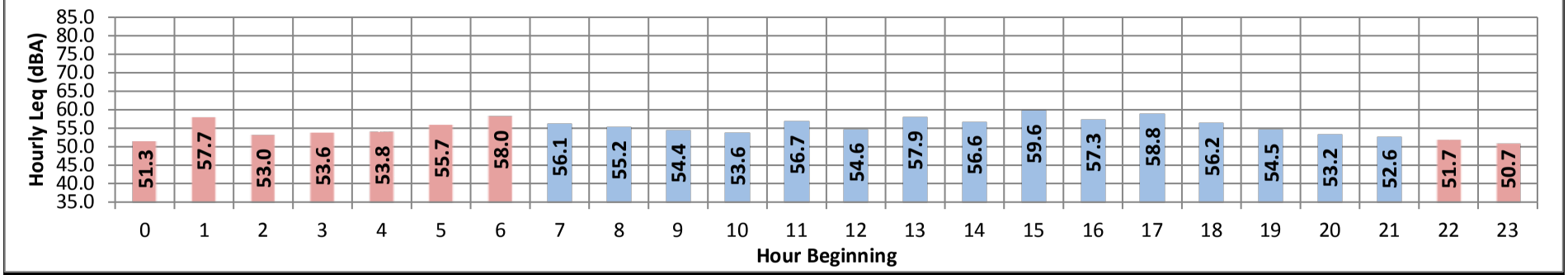


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | | | |
|---|---|---|---|---|---|
| *Project Name:* | The Park at Live Oak | *JN:* | 11112 | *Energy Average Leq* | *24-Hour* |
| *Location:* | L6- Located south of the Project site near Walnut Elementary School, existing residential homes, and Olive Middle School. | *Analyst:* | A. Wolfe | *Day* / *Night* | *CNEL* |
| | | *Date:* | 8/24/2017 | 56.3 / 54.7 | 61.6 |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 52.6 | 74.9 | 43.1 | Data Not Available at this Location. | | | | | | | | |
| | Max | 59.6 | 90.5 | 46.7 | | | | | | | | | |
| Energy Average: | | 56.3 | Average: | | | | | | | | | | |
| Night | Min | 50.7 | 67.1 | 42.6 | | | | | | | | | |
| | Max | 58.0 | 85.8 | 50.0 | | | | | | | | | |
| Energy Average: | | 54.7 | Average: | | | | | | | | | | |

***Hourly Summary***

| | | | | | |
|---|---|---|---|---|---|
| Night | 0 | 51.3 | 67.1 | 42.6 | Data Not Available at this Location. |
| | 1 | 57.7 | 80.3 | 50.0 | |
| | 2 | 53.0 | 71.2 | 47.5 | |
| | 3 | 53.6 | 73.6 | 48.2 | |
| | 4 | 53.8 | 77.3 | 47.0 | |
| | 5 | 55.7 | 81.4 | 46.1 | |
| | 6 | 58.0 | 85.8 | 46.6 | |
| Day | 7 | 56.1 | 76.0 | 43.4 | |
| | 8 | 55.2 | 82.6 | 43.4 | |
| | 9 | 54.4 | 74.9 | 43.1 | |
| | 10 | 53.6 | 80.0 | 43.2 | |
| | 11 | 56.7 | 81.0 | 43.3 | |
| | 12 | 54.6 | 78.0 | 43.8 | |
| | 13 | 57.9 | 82.9 | 44.7 | |
| | 14 | 56.6 | 80.3 | 44.0 | |
| | 15 | 59.6 | 90.5 | 46.7 | |
| | 16 | 57.3 | 83.6 | 45.2 | |
| | 17 | 58.8 | 86.8 | 45.5 | |
| | 18 | 56.2 | 84.9 | 45.0 | |
| | 19 | 54.5 | 76.1 | 44.8 | |
| | 20 | 53.2 | 76.4 | 44.3 | |
| | 21 | 52.6 | 77.5 | 45.0 | |
| Night | 22 | 51.7 | 76.8 | 45.8 | |
| | 23 | 50.7 | 68.3 | 46.5 | |

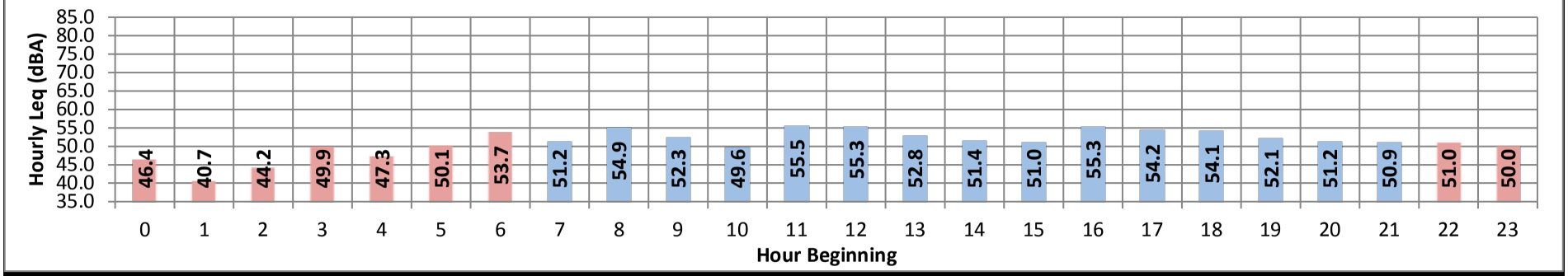


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | | Energy Average Leq | | 24-Hour |
|---|---|---|---|---|---|---|
| *Project Name:* | The Park at Live Oak | *JN:* | 11112 | *Day* | *Night* | *CNEL* |
| *Location:* | L7- Located southwest of the Project site near existing residential homes on Durfee Avenue. | *Analyst:* | A. Wolfe | 53.2 | 49.5 | 57.0 |
| | | *Date:* | 8/24/2017 | | | |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 49.6 | 66.0 | 42.0 | 59.0 | 56.0 | 53.0 | 51.0 | 46.0 | 45.0 | 43.0 | 43.0 | 42.0 |
| | Max | 55.5 | 80.9 | 46.0 | 69.0 | 65.0 | 60.0 | 57.0 | 51.0 | 48.0 | 47.0 | 47.0 | 46.0 |
| Energy Average: | | 53.2 | Average: | | 63.4 | 60.7 | 56.1 | 53.8 | 49.2 | 47.1 | 45.2 | 45.0 | 44.3 |
| Night | Min | 40.7 | 62.7 | 37.5 | 45.0 | 44.0 | 42.0 | 41.0 | 39.0 | 39.0 | 37.0 | 37.0 | 37.0 |
| | Max | 53.7 | 79.6 | 44.9 | 66.0 | 62.0 | 58.0 | 54.0 | 48.0 | 47.0 | 45.0 | 45.0 | 45.0 |
| Energy Average: | | 49.5 | Average: | | 57.4 | 53.3 | 49.2 | 47.2 | 44.0 | 43.1 | 41.7 | 41.6 | 41.2 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 46.4 | 67.9 | 42.1 | 56.0 | 50.0 | 45.0 | 44.0 | 43.0 | 43.0 | 43.0 | 43.0 | 42.0 |
| | 1 | 40.7 | 62.7 | 37.5 | 45.0 | 44.0 | 42.0 | 41.0 | 39.0 | 39.0 | 37.0 | 37.0 | 37.0 |
| | 2 | 44.2 | 69.9 | 37.5 | 53.0 | 48.0 | 44.0 | 43.0 | 40.0 | 39.0 | 37.0 | 37.0 | 37.0 |
| | 3 | 49.9 | 76.8 | 39.3 | 62.0 | 58.0 | 52.0 | 50.0 | 44.0 | 43.0 | 41.0 | 41.0 | 40.0 |
| | 4 | 47.3 | 68.9 | 41.4 | 58.0 | 52.0 | 48.0 | 46.0 | 44.0 | 43.0 | 42.0 | 42.0 | 42.0 |
| | 5 | 50.1 | 72.0 | 41.5 | 62.0 | 59.0 | 54.0 | 50.0 | 45.0 | 43.0 | 42.0 | 42.0 | 42.0 |
| | 6 | 53.7 | 75.5 | 41.4 | 66.0 | 62.0 | 58.0 | 54.0 | 48.0 | 47.0 | 44.0 | 43.0 | 42.0 |
| Day | 7 | 51.2 | 68.3 | 45.2 | 62.0 | 59.0 | 54.0 | 52.0 | 50.0 | 47.0 | 46.0 | 46.0 | 45.0 |
| | 8 | 54.9 | 77.5 | 42.0 | 69.0 | 65.0 | 58.0 | 54.0 | 47.0 | 46.0 | 43.0 | 43.0 | 42.0 |
| | 9 | 52.3 | 71.4 | 44.4 | 63.0 | 61.0 | 57.0 | 55.0 | 49.0 | 47.0 | 46.0 | 46.0 | 45.0 |
| | 10 | 49.6 | 66.0 | 44.5 | 59.0 | 56.0 | 53.0 | 51.0 | 48.0 | 47.0 | 46.0 | 45.0 | 45.0 |
| | 11 | 55.5 | 77.5 | 43.1 | 67.0 | 64.0 | 60.0 | 57.0 | 51.0 | 48.0 | 45.0 | 44.0 | 43.0 |
| | 12 | 55.3 | 80.9 | 43.2 | 65.0 | 61.0 | 56.0 | 54.0 | 50.0 | 47.0 | 44.0 | 44.0 | 43.0 |
| | 13 | 52.8 | 76.9 | 45.2 | 63.0 | 61.0 | 57.0 | 54.0 | 50.0 | 48.0 | 47.0 | 46.0 | 46.0 |
| | 14 | 51.4 | 70.5 | 46.0 | 62.0 | 59.0 | 55.0 | 53.0 | 50.0 | 48.0 | 47.0 | 47.0 | 46.0 |
| | 15 | 51.0 | 69.3 | 44.9 | 60.0 | 57.0 | 53.0 | 52.0 | 50.0 | 48.0 | 46.0 | 46.0 | 45.0 |
| | 16 | 55.3 | 79.3 | 43.9 | 65.0 | 62.0 | 58.0 | 56.0 | 51.0 | 48.0 | 45.0 | 45.0 | 44.0 |
| | 17 | 54.2 | 76.0 | 43.7 | 65.0 | 64.0 | 59.0 | 57.0 | 50.0 | 47.0 | 45.0 | 45.0 | 44.0 |
| | 18 | 54.1 | 77.6 | 44.3 | 64.0 | 62.0 | 58.0 | 56.0 | 51.0 | 48.0 | 45.0 | 45.0 | 44.0 |
| | 19 | 52.1 | 72.6 | 43.3 | 63.0 | 61.0 | 57.0 | 54.0 | 48.0 | 46.0 | 44.0 | 44.0 | 44.0 |
| | 20 | 51.2 | 74.4 | 43.4 | 62.0 | 59.0 | 54.0 | 51.0 | 46.0 | 45.0 | 44.0 | 44.0 | 44.0 |
| | 21 | 50.9 | 72.1 | 44.2 | 62.0 | 59.0 | 53.0 | 51.0 | 47.0 | 46.0 | 45.0 | 45.0 | 44.0 |
| Night | 22 | 51.0 | 79.6 | 44.9 | 58.0 | 55.0 | 52.0 | 51.0 | 48.0 | 46.0 | 45.0 | 45.0 | 45.0 |
| | 23 | 50.0 | 79.1 | 44.0 | 57.0 | 52.0 | 48.0 | 46.0 | 45.0 | 45.0 | 44.0 | 44.0 | 44.0 |

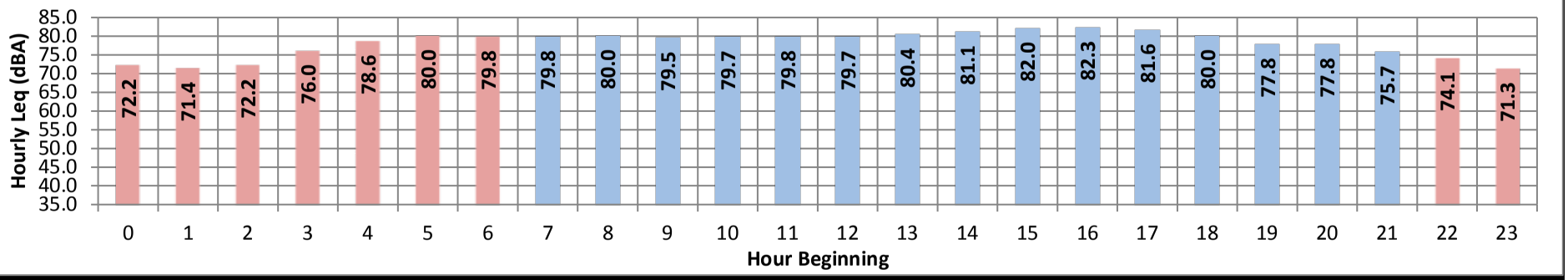


URBAN CROSSROADS

# 24-Hour Noise Level Measurement Summary

| | | | Energy Average Leq | | 24-Hour |
|---|---|---|---|---|---|
| *Project Name:* The Park at Live Oak | *JN:* 11112 | | *Day* | *Night* | *CNEL* |
| *Location:* L8- Located south of the Project site on Live Oak Avenue near the Irwindale Event Center and existing industrial uses. | *Analyst:* A. Wolfe | | 80.1 | 76.4 | 83.8 |
| | *Date:* 8/24/2017 | | | | |

***Hourly Leq dBA Readings (unadjusted)***




| *Time Period* | *Hour* | *Leq* | *Lmax* | *Lmin* | *L1%* | *L2%* | *L5%* | *L8%* | *L25%* | *L50%* | *L90%* | *L95%* | *L99%* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 75.7 | 93.1 | 49.6 | 85.0 | 84.0 | 82.0 | 80.0 | 75.0 | 69.0 | 56.0 | 54.0 | 50.0 |
| | Max | 82.3 | 104.2 | 61.9 | 89.0 | 87.0 | 85.0 | 85.0 | 83.0 | 81.0 | 76.0 | 73.0 | 70.0 |
| Energy Average: | | 80.1 | Average: | | 87.3 | 86.1 | 84.3 | 83.3 | 80.1 | 76.3 | 67.7 | 65.1 | 60.2 |
| Night | Min | 71.3 | 91.6 | 39.5 | 83.0 | 81.0 | 77.0 | 74.0 | 64.0 | 55.0 | 45.0 | 43.0 | 41.0 |
| | Max | 80.0 | 98.3 | 58.9 | 88.0 | 87.0 | 85.0 | 84.0 | 80.0 | 76.0 | 69.0 | 66.0 | 62.0 |
| Energy Average: | | 76.4 | Average: | | 85.3 | 83.7 | 81.0 | 79.3 | 72.2 | 65.2 | 55.1 | 52.9 | 49.9 |
| ***Hourly Summary*** | | | | | | | | | | | | | |
| Night | 0 | 72.2 | 91.6 | 39.5 | 84.0 | 82.0 | 79.0 | 77.0 | 68.0 | 59.0 | 47.0 | 44.0 | 41.0 |
| | 1 | 71.4 | 92.7 | 40.1 | 84.0 | 81.0 | 77.0 | 74.0 | 64.0 | 55.0 | 45.0 | 43.0 | 41.0 |
| | 2 | 72.2 | 92.7 | 42.3 | 84.0 | 82.0 | 79.0 | 76.0 | 66.0 | 57.0 | 49.0 | 47.0 | 43.0 |
| | 3 | 76.0 | 96.3 | 45.3 | 86.0 | 85.0 | 82.0 | 81.0 | 74.0 | 67.0 | 53.0 | 51.0 | 47.0 |
| | 4 | 78.6 | 93.2 | 55.8 | 88.0 | 86.0 | 84.0 | 83.0 | 79.0 | 73.0 | 63.0 | 60.0 | 58.0 |
| | 5 | 80.0 | 98.3 | 58.9 | 88.0 | 87.0 | 85.0 | 84.0 | 80.0 | 76.0 | 69.0 | 66.0 | 62.0 |
| | 6 | 79.8 | 93.5 | 56.4 | 87.0 | 86.0 | 85.0 | 84.0 | 80.0 | 76.0 | 67.0 | 64.0 | 61.0 |
| Day | 7 | 79.8 | 93.1 | 59.5 | 87.0 | 86.0 | 85.0 | 84.0 | 81.0 | 76.0 | 68.0 | 66.0 | 63.0 |
| | 8 | 80.0 | 95.0 | 55.0 | 88.0 | 87.0 | 85.0 | 84.0 | 80.0 | 77.0 | 68.0 | 66.0 | 60.0 |
| | 9 | 79.5 | 94.9 | 54.1 | 87.0 | 86.0 | 85.0 | 83.0 | 80.0 | 76.0 | 66.0 | 63.0 | 57.0 |
| | 10 | 79.7 | 97.0 | 52.0 | 88.0 | 87.0 | 85.0 | 83.0 | 80.0 | 76.0 | 66.0 | 63.0 | 56.0 |
| | 11 | 79.8 | 95.0 | 52.4 | 88.0 | 87.0 | 85.0 | 84.0 | 80.0 | 76.0 | 66.0 | 62.0 | 55.0 |
| | 12 | 79.7 | 95.6 | 53.2 | 88.0 | 86.0 | 84.0 | 83.0 | 80.0 | 76.0 | 67.0 | 64.0 | 58.0 |
| | 13 | 80.4 | 93.4 | 55.5 | 87.0 | 86.0 | 85.0 | 84.0 | 81.0 | 78.0 | 70.0 | 67.0 | 59.0 |
| | 14 | 81.1 | 100.7 | 56.4 | 88.0 | 87.0 | 85.0 | 84.0 | 82.0 | 79.0 | 71.0 | 69.0 | 64.0 |
| | 15 | 82.0 | 96.0 | 61.5 | 89.0 | 87.0 | 85.0 | 85.0 | 82.0 | 80.0 | 75.0 | 73.0 | 70.0 |
| | 16 | 82.3 | 97.3 | 59.9 | 88.0 | 87.0 | 85.0 | 85.0 | 83.0 | 81.0 | 76.0 | 73.0 | 70.0 |
| | 17 | 81.6 | 98.4 | 61.9 | 89.0 | 87.0 | 85.0 | 84.0 | 82.0 | 80.0 | 74.0 | 72.0 | 67.0 |
| | 18 | 80.0 | 97.8 | 57.4 | 87.0 | 86.0 | 84.0 | 83.0 | 81.0 | 77.0 | 68.0 | 65.0 | 60.0 |
| | 19 | 77.8 | 97.4 | 54.3 | 86.0 | 85.0 | 83.0 | 82.0 | 78.0 | 72.0 | 63.0 | 61.0 | 58.0 |
| | 20 | 77.8 | 104.2 | 54.3 | 85.0 | 84.0 | 82.0 | 81.0 | 76.0 | 71.0 | 62.0 | 59.0 | 56.0 |
| | 21 | 75.7 | 94.6 | 49.6 | 85.0 | 84.0 | 82.0 | 80.0 | 75.0 | 69.0 | 56.0 | 54.0 | 50.0 |
| Night | 22 | 74.1 | 96.3 | 47.0 | 84.0 | 83.0 | 80.0 | 79.0 | 72.0 | 66.0 | 53.0 | 52.0 | 49.0 |
| | 23 | 71.3 | 91.6 | 46.2 | 83.0 | 81.0 | 78.0 | 76.0 | 67.0 | 58.0 | 50.0 | 49.0 | 47.0 |



URBAN CROSSROADS

# APPENDIX 7.1:

# OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

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

Scenario: Existing Without Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 25,837 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,584 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.12 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.60 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.02 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 70.7 | 68.5 | 65.5 | 63.8 | 71.1 | 71.5 |
| Medium Trucks: | 72.2 | 70.4 | 64.3 | 65.1 | 72.6 | 72.7 |
| Heavy Trucks: | 75.1 | 73.6 | 64.6 | 66.7 | 74.7 | 74.8 |
| Vehicle Noise: | 77.8 | 76.1 | 69.6 | 70.1 | 77.8 | 78.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 99 | 214 | 461 | 993 |
| CNEL: | 102 | 220 | 473 | 1,020 |

Wednesday, May 02, 2018

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

Scenario: Existing Without Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 21,475 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,148 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 56 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 60.0 | feet |
| Centerline Dist. to Observer: | 60.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.32 | -0.52 | -1.20 | -4.69 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.41 | -0.50 | -1.20 | -4.88 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.82 | -0.50 | -1.20 | -5.34 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.1 | 63.9 | 61.0 | 59.2 | 66.6 | 66.9 |
| Medium Trucks: | 67.6 | 65.7 | 59.6 | 60.5 | 67.9 | 68.1 |
| Heavy Trucks: | 70.5 | 68.9 | 60.0 | 62.1 | 70.0 | 70.1 |
| Vehicle Noise: | 73.2 | 71.5 | 65.0 | 65.5 | 73.2 | 73.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 98 | 211 | 454 | 977 |
| CNEL: | 100 | 216 | 466 | 1,004 |

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

Scenario: Existing Without Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 6,136 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 614 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -4.12 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.85 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -16.27 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.5 | 62.3 | 59.3 | 57.6 | 64.9 | 65.2 |
| Medium Trucks: | 66.0 | 64.1 | 58.0 | 58.9 | 66.3 | 66.5 |
| Heavy Trucks: | 68.9 | 67.3 | 58.4 | 60.4 | 68.4 | 68.5 |
| Vehicle Noise: | 71.6 | 69.8 | 63.4 | 63.9 | 71.6 | 71.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 38 | 82 | 177 | 381 |
| CNEL: | 39 | 84 | 182 | 391 |

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

Scenario: Existing Without Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 15,611 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,561 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.06 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.79 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.21 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.5 | 66.3 | 63.4 | 61.6 | 69.0 | 69.3 |
| Medium Trucks: | 70.1 | 68.2 | 62.1 | 62.9 | 70.4 | 70.5 |
| Heavy Trucks: | 72.9 | 71.4 | 62.4 | 64.5 | 72.5 | 72.6 |
| Vehicle Noise: | 75.7 | 73.9 | 67.4 | 68.0 | 75.6 | 75.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 71 | 153 | 329 | 710 |
| CNEL: | 73 | 157 | 338 | 729 |

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

Scenario: Existing Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 5,363 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 536 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -4.70 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -14.43 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -16.85 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 63.9 | 61.7 | 58.7 | 57.0 | 64.3 | 64.6 |
| Medium Trucks: | 65.4 | 63.5 | 57.4 | 58.3 | 65.7 | 65.9 |
| Heavy Trucks: | 68.3 | 66.7 | 57.8 | 59.9 | 67.8 | 67.9 |
| Vehicle Noise: | 71.0 | 69.3 | 62.8 | 63.3 | 71.0 | 71.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 35 | 75 | 162 | 348 |
| CNEL: | 36 | 77 | 166 | 358 |

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

Scenario: Existing Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 2,535 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 254 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -7.96 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.68 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -20.10 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 60.6 | 58.4 | 55.5 | 53.7 | 61.1 | 61.4 |
| Medium Trucks: | 62.2 | 60.3 | 54.2 | 55.1 | 62.5 | 62.6 |
| Heavy Trucks: | 65.0 | 63.5 | 54.5 | 56.6 | 64.6 | 64.7 |
| Vehicle Noise: | 67.8 | 66.0 | 59.5 | 60.1 | 67.7 | 67.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 21 | 46 | 98 | 211 |
| CNEL: | 22 | 47 | 101 | 217 |

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

Scenario: Existing Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 11,042 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,104 | vehicles |
| Vehicle Speed: | 50 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -2.54 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -12.26 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -14.68 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.7 | 67.5 | 64.6 | 62.8 | 70.2 | 70.5 |
| Medium Trucks: | 70.9 | 69.0 | 62.9 | 63.8 | 71.2 | 71.3 |
| Heavy Trucks: | 72.8 | 71.3 | 62.3 | 64.4 | 72.4 | 72.5 |
| Vehicle Noise: | 76.1 | 74.3 | 68.1 | 68.5 | 76.1 | 76.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 77 | 165 | 356 | 766 |
| CNEL: | 79 | 170 | 366 | 788 |

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

Scenario: Existing Without Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 5,755 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 576 | vehicles |
| Vehicle Speed: | 30 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -3.15 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -12.87 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -15.29 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 58.8 | 56.6 | 53.6 | 51.9 | 59.2 | 59.5 |
| Medium Trucks: | 60.8 | 58.9 | 52.8 | 53.7 | 61.1 | 61.3 |
| Heavy Trucks: | 64.8 | 63.3 | 54.3 | 56.4 | 64.4 | 64.5 |
| Vehicle Noise: | 67.0 | 65.3 | 58.4 | 59.2 | 66.9 | 67.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 25 | 53 | 115 | 248 |
| CNEL: | 25 | 55 | 118 | 254 |

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

Scenario: Existing Without Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 11,684 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,168 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -1.32 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -11.05 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -13.47 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.7 | 62.5 | 59.5 | 57.8 | 65.1 | 65.4 |
| Medium Trucks: | 66.2 | 64.3 | 58.2 | 59.1 | 66.5 | 66.7 |
| Heavy Trucks: | 69.1 | 67.5 | 58.6 | 60.7 | 68.6 | 68.7 |
| Vehicle Noise: | 71.8 | 70.1 | 63.6 | 64.1 | 71.8 | 71.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 66 | 141 | 304 | 656 |
| CNEL: | 67 | 145 | 313 | 674 |

Wednesday, May 02, 2018

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

Scenario: Existing Without Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 10,106 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,011 | vehicles |
| Vehicle Speed: | 35 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -1.37 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -11.10 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -13.52 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 63.1 | 60.9 | 57.9 | 56.2 | 63.5 | 63.9 |
| Medium Trucks: | 64.9 | 63.0 | 56.9 | 57.8 | 65.2 | 65.3 |
| Heavy Trucks: | 68.3 | 66.7 | 57.8 | 59.9 | 67.8 | 67.9 |
| Vehicle Noise: | 70.7 | 69.0 | 62.3 | 63.0 | 70.6 | 70.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 44 | 95 | 205 | 442 |
| CNEL: | 45 | 98 | 210 | 453 |

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

Scenario: Existing Without Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 13,381 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,338 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.73 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.46 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.88 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 67.8 | 65.7 | 62.7 | 60.9 | 68.3 | 68.6 |
| Medium Trucks: | 69.4 | 67.5 | 61.4 | 62.3 | 69.7 | 69.9 |
| Heavy Trucks: | 72.2 | 70.7 | 61.7 | 63.8 | 71.8 | 71.9 |
| Vehicle Noise: | 75.0 | 73.2 | 66.8 | 67.3 | 74.9 | 75.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 64 | 138 | 297 | 640 |
| CNEL: | 66 | 142 | 305 | 658 |

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

Scenario: Existing Without Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 16,851 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,685 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.27 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.46 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.88 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.8 | 66.7 | 63.7 | 61.9 | 69.3 | 69.6 |
| Medium Trucks: | 70.4 | 68.5 | 62.4 | 63.3 | 70.7 | 70.9 |
| Heavy Trucks: | 73.2 | 71.7 | 62.7 | 64.8 | 72.8 | 72.9 |
| Vehicle Noise: | 76.0 | 74.2 | 67.8 | 68.3 | 75.9 | 76.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 75 | 161 | 347 | 747 |
| CNEL: | 77 | 165 | 356 | 767 |

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

Scenario: Existing Without Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 25,108 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,511 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 40 mph | | |
| Near/Far Lane Distance: | 48 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 48.0 feet | | |
| Centerline Dist. to Observer: | 48.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.00 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.73 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.15 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.4 | 66.2 | 63.2 | 61.5 | 68.8 | 69.1 |
| Medium Trucks: | 69.9 | 68.0 | 61.9 | 62.8 | 70.2 | 70.4 |
| Heavy Trucks: | 72.7 | 71.2 | 62.2 | 64.3 | 72.3 | 72.4 |
| Vehicle Noise: | 75.5 | 73.7 | 67.3 | 67.8 | 75.4 | 75.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 111 | 238 | 513 | 1,106 |
| CNEL: | 114 | 245 | 527 | 1,136 |



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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 23,789 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,379 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 48 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 40.0 feet | | |
| Centerline Dist. to Observer: | 40.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.25 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.47 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.89 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.2 | 69.0 | 66.1 | 64.3 | 71.7 | 72.0 |
| Medium Trucks: | 72.6 | 70.7 | 64.6 | 65.5 | 72.9 | 73.0 |
| Heavy Trucks: | 74.9 | 73.4 | 64.4 | 66.5 | 74.5 | 74.6 |
| Vehicle Noise: | 78.0 | 76.2 | 69.9 | 70.3 | 77.9 | 78.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 135 | 292 | 628 | 1,354 |
| CNEL: | 139 | 300 | 646 | 1,391 |



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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 41,218 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 4,122 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 48 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 40.0 feet | | |
| Centerline Dist. to Observer: | 40.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.64 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.09 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.50 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.6 | 71.4 | 68.5 | 66.7 | 74.1 | 74.4 |
| Medium Trucks: | 74.9 | 73.1 | 67.0 | 67.8 | 75.3 | 75.4 |
| Heavy Trucks: | 77.3 | 75.8 | 66.8 | 68.9 | 76.9 | 77.0 |
| Vehicle Noise: | 80.3 | 78.6 | 72.3 | 72.7 | 80.3 | 80.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 195 | 421 | 906 | 1,953 |
| CNEL: | 201 | 432 | 932 | 2,007 |



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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 27,508 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,751 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 48 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 40.0 feet | | |
| Centerline Dist. to Observer: | 40.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.88 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.84 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.26 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.9 | 69.7 | 66.7 | 65.0 | 72.3 | 72.6 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.7 |
| Heavy Trucks: | 75.6 | 74.0 | 65.1 | 67.2 | 75.1 | 75.2 |
| Vehicle Noise: | 78.6 | 76.8 | 70.5 | 70.9 | 78.6 | 78.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 149 | 321 | 692 | 1,491 |
| CNEL: | 153 | 330 | 711 | 1,533 |

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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 24,194 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,419 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.33 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.40 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.82 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.3 | 69.1 | 66.2 | 64.4 | 71.8 | 72.1 |
| Medium Trucks: | 72.6 | 70.7 | 64.7 | 65.5 | 72.9 | 73.1 |
| Heavy Trucks: | 75.0 | 73.5 | 64.5 | 66.6 | 74.6 | 74.7 |
| Vehicle Noise: | 78.0 | 76.3 | 69.9 | 70.4 | 78.0 | 78.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 137 | 295 | 635 | 1,369 |
| CNEL: | 141 | 303 | 653 | 1,407 |

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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 21,137 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,114 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 0.74 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.99 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -11.41 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 70.7 | 68.5 | 65.6 | 63.8 | 71.2 | 71.5 |
| Medium Trucks: | 72.0 | 70.2 | 64.1 | 64.9 | 72.4 | 72.5 |
| Heavy Trucks: | 74.4 | 72.9 | 63.9 | 66.0 | 74.0 | 74.1 |
| Vehicle Noise: | 77.4 | 75.7 | 69.4 | 69.8 | 77.4 | 77.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 125 | 270 | 581 | 1,251 |
| CNEL: | 129 | 277 | 597 | 1,286 |

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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 44,296 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,430 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.95 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.77 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.19 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.9 | 71.7 | 68.8 | 67.0 | 74.4 | 74.7 |
| Medium Trucks: | 75.3 | 73.4 | 67.3 | 68.2 | 75.6 | 75.7 |
| Heavy Trucks: | 77.6 | 76.1 | 67.1 | 69.2 | 77.2 | 77.3 |
| Vehicle Noise: | 80.7 | 78.9 | 72.6 | 73.0 | 80.6 | 80.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 205 | 441 | 951 | 2,049 |
| CNEL: | 211 | 454 | 977 | 2,106 |

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

Scenario: Existing Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 32,875 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,288 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.66 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.07 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.49 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.6 | 70.5 | 67.5 | 65.7 | 73.1 | 73.4 |
| Medium Trucks: | 74.0 | 72.1 | 66.0 | 66.9 | 74.3 | 74.4 |
| Heavy Trucks: | 76.3 | 74.8 | 65.8 | 67.9 | 75.9 | 76.0 |
| Vehicle Noise: | 79.4 | 77.6 | 71.3 | 71.7 | 79.3 | 79.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 168 | 362 | 779 | 1,679 |
| CNEL: | 173 | 372 | 801 | 1,726 |

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

Scenario: Existing Without Project | Project Name: The Park @ Live Oak
Road Name: Live Oak Av. | Job Number: 11112
Road Segment: w/o Rivergrade Rd.

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 27,508 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,751 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 80 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 50.0 feet | | |
| Centerline Dist. to Observer: | 50.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.88 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.84 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.26 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.3 | 70.1 | 67.1 | 65.4 | 72.7 | 73.0 |
| Medium Trucks: | 73.6 | 71.7 | 65.6 | 66.5 | 73.9 | 74.1 |
| Heavy Trucks: | 76.0 | 74.5 | 65.5 | 67.6 | 75.5 | 75.7 |
| Vehicle Noise: | 79.0 | 77.2 | 70.9 | 71.4 | 79.0 | 79.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 199 | 428 | 922 | 1,987 |
| CNEL: | 204 | 440 | 948 | 2,042 |

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

Scenario: Existing Without Project | Project Name: The Park @ Live Oak
Road Name: Live Oak Av. | Job Number: 11112
Road Segment: e/o Rivergrade Rd.

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 30,406 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 3,041 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 80 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 50.0 feet | | |
| Centerline Dist. to Observer: | 50.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.32 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.41 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.83 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.7 | 70.5 | 67.6 | 65.8 | 73.2 | 73.5 |
| Medium Trucks: | 74.0 | 72.2 | 66.1 | 66.9 | 74.3 | 74.5 |
| Heavy Trucks: | 76.4 | 74.9 | 65.9 | 68.0 | 76.0 | 76.1 |
| Vehicle Noise: | 79.4 | 77.7 | 71.4 | 71.8 | 79.4 | 79.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 212 | 458 | 986 | 2,124 |
| CNEL: | 218 | 470 | 1,013 | 2,183 |

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

Scenario: Existing Without Project | Project Name: The Park @ Live Oak
Road Name: Live Oak Av. | Job Number: 11112
Road Segment: e/o Stewart Av.

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 29,466 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,947 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 80 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 50.0 feet | | |
| Centerline Dist. to Observer: | 50.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.18 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.54 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.96 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.6 | 70.4 | 67.4 | 65.7 | 73.0 | 73.3 |
| Medium Trucks: | 73.9 | 72.0 | 65.9 | 66.8 | 74.2 | 74.4 |
| Heavy Trucks: | 76.3 | 74.7 | 65.8 | 67.9 | 75.8 | 76.0 |
| Vehicle Noise: | 79.3 | 77.5 | 71.2 | 71.7 | 79.3 | 79.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 208 | 448 | 965 | 2,080 |
| CNEL: | 214 | 461 | 992 | 2,138 |

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

Scenario: Existing Without Project | Project Name: The Park @ Live Oak
Road Name: Live Oak Av. | Job Number: 11112
Road Segment: w/o Arrow Hwy.

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 25,119 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 2,512 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 45 mph | | |
| Near/Far Lane Distance: | 80 feet | | |
| **Site Data** | | **Vehicle Mix** | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 50.0 feet | | |
| Centerline Dist. to Observer: | 50.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.49 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.24 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.66 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.9 | 69.7 | 66.7 | 65.0 | 72.3 | 72.6 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.7 |
| Heavy Trucks: | 75.6 | 74.1 | 65.1 | 67.2 | 75.2 | 75.3 |
| Vehicle Noise: | 78.6 | 76.8 | 70.5 | 71.0 | 78.6 | 78.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 187 | 403 | 868 | 1,870 |
| CNEL: | 192 | 414 | 892 | 1,922 |

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

Scenario: Existing With Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 26,527 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,653 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.02% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.89% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.09% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.26 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.60 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.02 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 70.8 | 68.6 | 65.7 | 63.9 | 71.3 | 71.6 |
| Medium Trucks: | 72.2 | 70.4 | 64.3 | 65.1 | 72.6 | 72.7 |
| Heavy Trucks: | 75.1 | 73.6 | 64.6 | 66.7 | 74.7 | 74.8 |
| Vehicle Noise: | 77.9 | 76.1 | 69.7 | 70.2 | 77.8 | 78.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 100 | 215 | 463 | 998 |
| CNEL: | 102 | 221 | 476 | 1,025 |



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

Scenario: Existing With Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 22,165 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,216 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 56 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 60.0 | feet |
| Centerline Dist. to Observer: | 60.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.10% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.84% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.06% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.48 | -0.52 | -1.20 | -4.69 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.41 | -0.50 | -1.20 | -4.88 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.82 | -0.50 | -1.20 | -5.34 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.3 | 64.1 | 61.1 | 59.4 | 66.7 | 67.0 |
| Medium Trucks: | 67.6 | 65.7 | 59.6 | 60.5 | 67.9 | 68.1 |
| Heavy Trucks: | 70.5 | 68.9 | 60.0 | 62.1 | 70.0 | 70.1 |
| Vehicle Noise: | 73.3 | 71.5 | 65.1 | 65.6 | 73.2 | 73.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 98 | 212 | 456 | 983 |
| CNEL: | 101 | 217 | 469 | 1,009 |



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

Scenario: Existing With Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 6,826 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 683 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.10% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.20% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.70% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -3.58 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.85 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -16.27 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.0 | 62.8 | 59.8 | 58.1 | 65.4 | 65.7 |
| Medium Trucks: | 66.0 | 64.1 | 58.0 | 58.9 | 66.3 | 66.5 |
| Heavy Trucks: | 68.9 | 67.3 | 58.4 | 60.4 | 68.4 | 68.5 |
| Vehicle Noise: | 71.7 | 69.9 | 63.6 | 64.0 | 71.7 | 71.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 39 | 84 | 180 | 388 |
| CNEL: | 40 | 86 | 185 | 399 |



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

Scenario: Existing With Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 16,301 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,630 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.26% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.74% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.00% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.15 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.79 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.21 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.7 | 66.5 | 63.6 | 61.8 | 69.2 | 69.5 |
| Medium Trucks: | 70.1 | 68.2 | 62.1 | 62.9 | 70.4 | 70.5 |
| Heavy Trucks: | 72.9 | 71.4 | 62.4 | 64.5 | 72.5 | 72.6 |
| Vehicle Noise: | 75.7 | 73.9 | 67.5 | 68.0 | 75.7 | 75.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 72 | 154 | 332 | 715 |
| CNEL: | 73 | 158 | 341 | 735 |

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

Scenario: Existing With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 8,399 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 840 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 40 mph | | |
| Near/Far Lane Distance: | 12 feet | | |
| **Site Data** | | | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 30.0 feet | | |
| Centerline Dist. to Observer: | 30.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 90.84% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 5.83% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 3.34% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -2.50 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -14.43 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -16.85 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.1 | 63.9 | 60.9 | 59.2 | 66.5 | 66.8 |
| Medium Trucks: | 65.4 | 63.5 | 57.4 | 58.3 | 65.7 | 65.9 |
| Heavy Trucks: | 68.3 | 66.7 | 57.8 | 59.9 | 67.8 | 67.9 |
| Vehicle Noise: | 71.5 | 69.7 | 63.8 | 63.9 | 71.5 | 71.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 38 | 82 | 177 | 381 |
| CNEL: | 39 | 84 | 182 | 392 |

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

Scenario: Existing With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 5,571 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 557 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 40 mph | | |
| Near/Far Lane Distance: | 12 feet | | |
| **Site Data** | | | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 30.0 feet | | |
| Centerline Dist. to Observer: | 30.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 93.47% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 4.15% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 2.38% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -4.16 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.68 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -20.10 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.4 | 62.2 | 59.3 | 57.5 | 64.9 | 65.2 |
| Medium Trucks: | 62.2 | 60.3 | 54.2 | 55.1 | 62.5 | 62.6 |
| Heavy Trucks: | 65.0 | 63.5 | 54.5 | 56.6 | 64.6 | 64.7 |
| Vehicle Noise: | 68.8 | 67.0 | 61.4 | 61.3 | 68.9 | 69.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 25 | 54 | 117 | 252 |
| CNEL: | 26 | 56 | 121 | 260 |

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

Scenario: Existing With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 11,594 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 1,159 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 50 mph | | |
| Near/Far Lane Distance: | 12 feet | | |
| **Site Data** | | | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 30.0 feet | | |
| Centerline Dist. to Observer: | 30.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.33% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.69% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.98% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -2.29 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -12.26 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -14.68 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 70.0 | 67.8 | 64.8 | 63.1 | 70.4 | 70.7 |
| Medium Trucks: | 70.9 | 69.0 | 62.9 | 63.8 | 71.2 | 71.3 |
| Heavy Trucks: | 72.8 | 71.3 | 62.3 | 64.4 | 72.4 | 72.5 |
| Vehicle Noise: | 76.2 | 74.4 | 68.3 | 68.6 | 76.2 | 76.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 77 | 167 | 359 | 774 |
| CNEL: | 80 | 172 | 370 | 796 |

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

Scenario: Existing With Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

| SITE SPECIFIC INPUT DATA | | NOISE MODEL INPUTS | |
|---|---|---|---|
| **Highway Data** | | **Site Conditions (Hard = 10, Soft = 15)** | |
| Average Daily Traffic (Adt): | 6,445 vehicles | Autos: | 15 |
| Peak Hour Percentage: | 10% | Medium Trucks (2 Axles): | 15 |
| Peak Hour Volume: | 644 vehicles | Heavy Trucks (3+ Axles): | 15 |
| Vehicle Speed: | 30 mph | | |
| Near/Far Lane Distance: | 12 feet | | |
| **Site Data** | | | |
| **Barrier Height:** | **0.0 feet** | | |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | | |
| Centerline Dist. to Barrier: | 40.0 feet | | |
| Centerline Dist. to Observer: | 40.0 feet | | |
| Barrier Distance to Observer: | 0.0 feet | | |
| Observer Height (Above Pad): | 5.0 feet | | |
| Pad Elevation: | 0.0 feet | | |
| Road Elevation: | 0.0 feet | | |
| Road Grade: | 0.0% | | |
| Left View: | -90.0 degrees | | |
| Right View: | 90.0 degrees | | |

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.19% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.15% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.67% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -2.58 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -12.87 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -15.29 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 59.3 | 57.2 | 54.2 | 52.4 | 59.8 | 60.1 |
| Medium Trucks: | 60.8 | 58.9 | 52.8 | 53.7 | 61.1 | 61.3 |
| Heavy Trucks: | 64.8 | 63.3 | 54.3 | 56.4 | 64.4 | 64.5 |
| Vehicle Noise: | 67.1 | 65.4 | 58.6 | 59.3 | 67.0 | 67.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 25 | 54 | 117 | 252 |
| CNEL: | 26 | 56 | 120 | 258 |

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

Scenario: Existing With Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 12,374 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,237 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.45% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.61% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.93% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -1.03 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -11.05 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -13.47 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.0 | 62.8 | 59.8 | 58.1 | 65.4 | 65.7 |
| Medium Trucks: | 66.2 | 64.3 | 58.2 | 59.1 | 66.5 | 66.7 |
| Heavy Trucks: | 69.1 | 67.5 | 58.6 | 60.7 | 68.6 | 68.7 |
| Vehicle Noise: | 71.9 | 70.1 | 63.7 | 64.2 | 71.8 | 72.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 66 | 143 | 307 | 662 |
| CNEL: | 68 | 147 | 316 | 681 |

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

Scenario: Existing With Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 10,796 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,080 | vehicles |
| Vehicle Speed: | 35 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.57% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.54% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.89% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -1.04 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -11.10 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -13.52 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 63.4 | 61.2 | 58.3 | 56.5 | 63.9 | 64.2 |
| Medium Trucks: | 64.9 | 63.0 | 56.9 | 57.8 | 65.2 | 65.3 |
| Heavy Trucks: | 68.3 | 66.7 | 57.8 | 59.9 | 67.8 | 67.9 |
| Vehicle Noise: | 70.8 | 69.0 | 62.4 | 63.0 | 70.7 | 70.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 45 | 96 | 207 | 446 |
| CNEL: | 46 | 99 | 213 | 458 |

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

Scenario: Existing With Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 14,071 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,407 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.35% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.68% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.97% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.48 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.46 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.88 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.1 | 65.9 | 62.9 | 61.2 | 68.5 | 68.8 |
| Medium Trucks: | 69.4 | 67.5 | 61.4 | 62.3 | 69.7 | 69.9 |
| Heavy Trucks: | 72.2 | 70.7 | 61.7 | 63.8 | 71.8 | 71.9 |
| Vehicle Noise: | 75.0 | 73.3 | 66.9 | 67.3 | 75.0 | 75.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 65 | 139 | 300 | 646 |
| CNEL: | 66 | 143 | 308 | 664 |

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

Scenario: Existing With Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 18,231 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,823 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.74% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.43% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.83% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.66 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.46 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.88 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.2 | 67.0 | 64.1 | 62.3 | 69.7 | 70.0 |
| Medium Trucks: | 70.4 | 68.5 | 62.4 | 63.3 | 70.7 | 70.9 |
| Heavy Trucks: | 73.2 | 71.7 | 62.7 | 64.8 | 72.8 | 72.9 |
| Vehicle Noise: | 76.1 | 74.3 | 67.9 | 68.4 | 76.0 | 76.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 76 | 163 | 351 | 757 |
| CNEL: | 78 | 168 | 361 | 778 |

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

Scenario: Existing With Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 25,822 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,582 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 48.0 | feet |
| Centerline Dist. to Observer: | 48.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.95% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.89% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.16% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.14 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.72 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.08 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.5 | 66.3 | 63.3 | 61.6 | 68.9 | 69.3 |
| Medium Trucks: | 69.9 | 68.0 | 61.9 | 62.8 | 70.2 | 70.4 |
| Heavy Trucks: | 72.8 | 71.3 | 62.3 | 64.4 | 72.4 | 72.5 |
| Vehicle Noise: | 75.5 | 73.8 | 67.3 | 67.8 | 75.5 | 75.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 112 | 241 | 518 | 1,117 |
| CNEL: | 115 | 247 | 533 | 1,148 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 25,193 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,519 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.36% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.63% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.01% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.54 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.46 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.82 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.5 | 69.3 | 66.4 | 64.6 | 72.0 | 72.3 |
| Medium Trucks: | 72.6 | 70.7 | 64.6 | 65.5 | 72.9 | 73.0 |
| Heavy Trucks: | 75.0 | 73.5 | 64.5 | 66.6 | 74.6 | 74.7 |
| Vehicle Noise: | 78.1 | 76.3 | 70.0 | 70.4 | 78.0 | 78.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 137 | 296 | 638 | 1,375 |
| CNEL: | 141 | 305 | 656 | 1,414 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 44,002 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,400 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.50% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.55% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.94% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.97 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.08 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.46 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.0 | 71.8 | 68.8 | 67.1 | 74.4 | 74.7 |
| Medium Trucks: | 74.9 | 73.1 | 67.0 | 67.8 | 75.3 | 75.4 |
| Heavy Trucks: | 77.4 | 75.8 | 66.9 | 69.0 | 76.9 | 77.0 |
| Vehicle Noise: | 80.4 | 78.7 | 72.4 | 72.8 | 80.4 | 80.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 198 | 427 | 920 | 1,982 |
| CNEL: | 204 | 439 | 946 | 2,038 |

Wednesday, May 02, 2018

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,924 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,192 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.64% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 7.86% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.50% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.63 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.84 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.26 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.6 | 70.4 | 67.5 | 65.7 | 73.1 | 73.4 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.7 |
| Heavy Trucks: | 75.6 | 74.0 | 65.1 | 67.2 | 75.1 | 75.2 |
| Vehicle Noise: | 78.8 | 77.0 | 70.8 | 71.1 | 78.8 | 78.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 153 | 331 | 712 | 1,535 |
| CNEL: | 158 | 340 | 733 | 1,579 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,610 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,861 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.87% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 7.71% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.42% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.17 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.40 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.82 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.2 | 70.0 | 67.0 | 65.3 | 72.6 | 72.9 |
| Medium Trucks: | 72.6 | 70.7 | 64.7 | 65.5 | 72.9 | 73.1 |
| Heavy Trucks: | 75.0 | 73.5 | 64.5 | 66.6 | 74.6 | 74.7 |
| Vehicle Noise: | 78.2 | 76.4 | 70.3 | 70.6 | 78.2 | 78.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 141 | 305 | 657 | 1,414 |
| CNEL: | 146 | 314 | 676 | 1,455 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 22,517 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,252 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.53% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.56% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.91% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.06 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.99 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -11.41 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.0 | 68.9 | 65.9 | 64.2 | 71.5 | 71.8 |
| Medium Trucks: | 72.0 | 70.2 | 64.1 | 64.9 | 72.4 | 72.5 |
| Heavy Trucks: | 74.4 | 72.9 | 63.9 | 66.0 | 74.0 | 74.1 |
| Vehicle Noise: | 77.5 | 75.7 | 69.5 | 69.9 | 77.5 | 77.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 127 | 273 | 588 | 1,266 |
| CNEL: | 130 | 280 | 604 | 1,302 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 45,676 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,568 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.08% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.85% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.07% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.11 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.77 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.19 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.1 | 71.9 | 68.9 | 67.2 | 74.5 | 74.8 |
| Medium Trucks: | 75.3 | 73.4 | 67.3 | 68.2 | 75.6 | 75.7 |
| Heavy Trucks: | 77.6 | 76.1 | 67.1 | 69.2 | 77.2 | 77.3 |
| Vehicle Noise: | 80.7 | 78.9 | 72.6 | 73.0 | 80.7 | 80.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 206 | 444 | 956 | 2,060 |
| CNEL: | 212 | 456 | 983 | 2,118 |

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

Scenario: Existing With Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,719 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,372 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.96% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.90% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.13% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.78 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.06 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.45 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.8 | 70.6 | 67.6 | 65.9 | 73.2 | 73.5 |
| Medium Trucks: | 74.0 | 72.1 | 66.0 | 66.9 | 74.3 | 74.4 |
| Heavy Trucks: | 76.4 | 74.8 | 65.9 | 68.0 | 75.9 | 76.1 |
| Vehicle Noise: | 79.4 | 77.6 | 71.3 | 71.8 | 79.4 | 79.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 169 | 364 | 785 | 1,691 |
| CNEL: | 174 | 375 | 807 | 1,739 |

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

Scenario: Existing With Project
Road Name: Live Oak Av.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 29,456 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,946 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.55% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.53% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.92% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.23 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.84 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.22 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.6 | 70.4 | 67.5 | 65.7 | 73.1 | 73.4 |
| Medium Trucks: | 73.6 | 71.7 | 65.6 | 66.5 | 73.9 | 74.1 |
| Heavy Trucks: | 76.0 | 74.5 | 65.5 | 67.6 | 75.6 | 75.7 |
| Vehicle Noise: | 79.1 | 77.3 | 71.1 | 71.5 | 79.1 | 79.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 202 | 435 | 937 | 2,018 |
| CNEL: | 208 | 447 | 963 | 2,075 |

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

Scenario: Existing With Project
Road Name: Live Oak Av.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,802 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,180 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.23% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.73% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.04% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.54 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.40 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.79 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.9 | 70.7 | 67.8 | 66.0 | 73.4 | 73.7 |
| Medium Trucks: | 74.0 | 72.2 | 66.1 | 66.9 | 74.4 | 74.5 |
| Heavy Trucks: | 76.5 | 74.9 | 66.0 | 68.1 | 76.0 | 76.1 |
| Vehicle Noise: | 79.5 | 77.7 | 71.5 | 71.9 | 79.5 | 79.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 215 | 463 | 997 | 2,147 |
| CNEL: | 221 | 476 | 1,025 | 2,208 |

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

Scenario: Existing With Project
Road Name: Live Oak Av.
Road Segment: e/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 30,172 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,017 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.93% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.92% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.15% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.30 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.54 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.93 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.7 | 70.5 | 67.5 | 65.8 | 73.1 | 73.4 |
| Medium Trucks: | 73.9 | 72.0 | 65.9 | 66.8 | 74.2 | 74.4 |
| Heavy Trucks: | 76.3 | 74.8 | 65.8 | 67.9 | 75.9 | 76.0 |
| Vehicle Noise: | 79.3 | 77.6 | 71.3 | 71.7 | 79.3 | 79.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 209 | 451 | 972 | 2,094 |
| CNEL: | 215 | 464 | 999 | 2,153 |

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

Scenario: Existing With Project
Road Name: Live Oak Av.
Road Segment: w/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 25,825 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,582 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.98% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.89% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.13% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.63 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.23 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.61 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.0 | 69.8 | 66.9 | 65.1 | 72.5 | 72.8 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.7 |
| Heavy Trucks: | 75.6 | 74.1 | 65.1 | 67.2 | 75.2 | 75.3 |
| Vehicle Noise: | 78.7 | 76.9 | 70.6 | 71.0 | 78.6 | 78.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 189 | 406 | 875 | 1,885 |
| CNEL: | 194 | 418 | 900 | 1,938 |

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

Scenario: OY 2020 Without Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 27,774 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,777 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.44 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.29 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.71 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.0 | 68.8 | 65.9 | 64.1 | 71.5 | 71.8 |
| Medium Trucks: | 72.6 | 70.7 | 64.6 | 65.4 | 72.9 | 73.0 |
| Heavy Trucks: | 75.4 | 73.9 | 64.9 | 67.0 | 75.0 | 75.1 |
| Vehicle Noise: | 78.2 | 76.4 | 69.9 | 70.5 | 78.1 | 78.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 104 | 225 | 484 | 1,042 |
| CNEL: | 107 | 231 | 497 | 1,070 |

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

Scenario: OY 2020 Without Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 23,235 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,324 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 56 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 60.0 | feet |
| Centerline Dist. to Observer: | 60.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.66 | -0.52 | -1.20 | -4.69 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.06 | -0.50 | -1.20 | -4.88 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.48 | -0.50 | -1.20 | -5.34 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.5 | 64.3 | 61.3 | 59.6 | 66.9 | 67.2 |
| Medium Trucks: | 68.0 | 66.1 | 60.0 | 60.8 | 68.3 | 68.4 |
| Heavy Trucks: | 70.8 | 69.3 | 60.3 | 62.4 | 70.4 | 70.5 |
| Vehicle Noise: | 73.6 | 71.8 | 65.3 | 65.9 | 73.5 | 73.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 103 | 222 | 478 | 1,030 |
| CNEL: | 106 | 228 | 491 | 1,058 |

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

Scenario: OY 2020 Without Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 6,857 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 686 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -3.64 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.36 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.78 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.9 | 62.7 | 59.8 | 58.0 | 65.4 | 65.7 |
| Medium Trucks: | 66.5 | 64.6 | 58.5 | 59.4 | 66.8 | 67.0 |
| Heavy Trucks: | 69.3 | 67.8 | 58.8 | 60.9 | 68.9 | 69.0 |
| Vehicle Noise: | 72.1 | 70.3 | 63.8 | 64.4 | 72.0 | 72.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 41 | 88 | 190 | 410 |
| CNEL: | 42 | 91 | 196 | 421 |

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

Scenario: OY 2020 Without Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 17,446 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,745 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.42 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.31 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.73 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.0 | 66.8 | 63.8 | 62.1 | 69.4 | 69.7 |
| Medium Trucks: | 70.5 | 68.7 | 62.6 | 63.4 | 70.8 | 71.0 |
| Heavy Trucks: | 73.4 | 71.9 | 62.9 | 65.0 | 73.0 | 73.1 |
| Vehicle Noise: | 76.1 | 74.4 | 67.9 | 68.4 | 76.1 | 76.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 76 | 165 | 355 | 764 |
| CNEL: | 79 | 169 | 364 | 785 |

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

Scenario: OY 2020 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 8,112 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 811 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -2.91 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -12.63 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.05 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.7 | 63.5 | 60.5 | 58.8 | 66.1 | 66.4 |
| Medium Trucks: | 67.2 | 65.3 | 59.2 | 60.1 | 67.5 | 67.7 |
| Heavy Trucks: | 70.1 | 68.5 | 59.6 | 61.7 | 69.6 | 69.7 |
| Vehicle Noise: | 72.8 | 71.1 | 64.6 | 65.1 | 72.8 | 72.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 46 | 99 | 213 | 459 |
| CNEL: | 47 | 102 | 219 | 471 |

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

Scenario: OY 2020 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 2,690 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 269 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -7.70 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.43 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -19.85 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 60.9 | 58.7 | 55.7 | 54.0 | 61.3 | 61.6 |
| Medium Trucks: | 62.4 | 60.5 | 54.4 | 55.3 | 62.7 | 62.9 |
| Heavy Trucks: | 65.3 | 63.7 | 54.8 | 56.9 | 64.8 | 64.9 |
| Vehicle Noise: | 68.0 | 66.3 | 59.8 | 60.3 | 68.0 | 68.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 22 | 47 | 102 | 220 |
| CNEL: | 23 | 49 | 105 | 226 |

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

Scenario: OY 2020 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 14,673 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,467 vehicles |
| Vehicle Speed: | 50 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -1.30 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -11.03 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -13.45 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.0 | 68.8 | 65.8 | 64.1 | 71.4 | 71.7 |
| Medium Trucks: | 72.1 | 70.2 | 64.1 | 65.0 | 72.4 | 72.6 |
| Heavy Trucks: | 74.1 | 72.5 | 63.6 | 65.7 | 73.6 | 73.7 |
| Vehicle Noise: | 77.3 | 75.6 | 69.4 | 69.7 | 77.3 | 77.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 93 | 200 | 430 | 926 |
| CNEL: | 95 | 205 | 442 | 953 |

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

Scenario: OY 2020 Without Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 6,771 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 677 vehicles |
| Vehicle Speed: | 30 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -2.44 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -12.17 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -14.59 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 59.5 | 57.3 | 54.3 | 52.6 | 59.9 | 60.2 |
| Medium Trucks: | 61.5 | 59.6 | 53.5 | 54.4 | 61.8 | 62.0 |
| Heavy Trucks: | 65.5 | 64.0 | 55.0 | 57.1 | 65.1 | 65.2 |
| Vehicle Noise: | 67.7 | 66.0 | 59.1 | 59.9 | 67.6 | 67.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 28 | 60 | 128 | 276 |
| CNEL: | 28 | 61 | 132 | 283 |

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

Scenario: OY 2020 Without Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 13,419 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,342 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 50.0 feet |
| Centerline Dist. to Observer: | 50.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.72 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.45 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.87 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.3 | 63.1 | 60.1 | 58.4 | 65.7 | 66.0 |
| Medium Trucks: | 66.8 | 64.9 | 58.8 | 59.7 | 67.1 | 67.3 |
| Heavy Trucks: | 69.7 | 68.1 | 59.2 | 61.3 | 69.2 | 69.3 |
| Vehicle Noise: | 72.4 | 70.7 | 64.2 | 64.7 | 72.4 | 72.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 72 | 155 | 334 | 719 |
| CNEL: | 74 | 159 | 343 | 739 |



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

Scenario: OY 2020 Without Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 11,725 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,173 vehicles |
| Vehicle Speed: | 35 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -0.73 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -10.45 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -12.87 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 63.7 | 61.6 | 58.6 | 56.9 | 64.2 | 64.5 |
| Medium Trucks: | 65.5 | 63.6 | 57.5 | 58.4 | 65.8 | 66.0 |
| Heavy Trucks: | 68.9 | 67.4 | 58.4 | 60.5 | 68.5 | 68.6 |
| Vehicle Noise: | 71.4 | 69.6 | 63.0 | 63.6 | 71.3 | 71.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 49 | 105 | 226 | 488 |
| CNEL: | 50 | 108 | 232 | 500 |



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

Scenario: OY 2020 Without Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 14,556 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,456 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.37 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.09 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.51 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.2 | 66.0 | 63.1 | 61.3 | 68.6 | 69.0 |
| Medium Trucks: | 69.8 | 67.9 | 61.8 | 62.6 | 70.1 | 70.2 |
| Heavy Trucks: | 72.6 | 71.1 | 62.1 | 64.2 | 72.2 | 72.3 |
| Vehicle Noise: | 75.3 | 73.6 | 67.1 | 67.7 | 75.3 | 75.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 68 | 146 | 314 | 677 |
| CNEL: | 70 | 150 | 323 | 696 |



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

Scenario: OY 2020 Without Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 18,595 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,860 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.70 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.03 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.45 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.3 | 67.1 | 64.1 | 62.4 | 69.7 | 70.0 |
| Medium Trucks: | 70.8 | 68.9 | 62.8 | 63.7 | 71.1 | 71.3 |
| Heavy Trucks: | 73.7 | 72.1 | 63.2 | 65.3 | 73.2 | 73.3 |
| Vehicle Noise: | 76.4 | 74.7 | 68.2 | 68.7 | 76.4 | 76.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 80 | 172 | 370 | 798 |
| CNEL: | 82 | 176 | 380 | 819 |

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

Scenario: OY 2020 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 27,883 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,788 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 48.0 | feet |
| Centerline Dist. to Observer: | 48.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.45 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.27 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.69 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.8 | 66.6 | 63.7 | 61.9 | 69.3 | 69.6 |
| Medium Trucks: | 70.3 | 68.4 | 62.3 | 63.2 | 70.6 | 70.8 |
| Heavy Trucks: | 73.2 | 71.7 | 62.7 | 64.8 | 72.7 | 72.9 |
| Vehicle Noise: | 75.9 | 74.2 | 67.7 | 68.2 | 75.9 | 76.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 119 | 256 | 551 | 1,186 |
| CNEL: | 122 | 263 | 566 | 1,218 |

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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 26,917 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,692 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.79 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.94 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.36 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.8 | 69.6 | 66.6 | 64.9 | 72.2 | 72.5 |
| Medium Trucks: | 73.1 | 71.2 | 65.1 | 66.0 | 73.4 | 73.6 |
| Heavy Trucks: | 75.5 | 73.9 | 65.0 | 67.1 | 75.0 | 75.1 |
| Vehicle Noise: | 78.5 | 76.7 | 70.4 | 70.8 | 78.5 | 78.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 147 | 317 | 682 | 1,470 |
| CNEL: | 151 | 325 | 701 | 1,511 |

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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 46,253 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,625 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.14 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.58 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.00 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.1 | 71.9 | 69.0 | 67.2 | 74.6 | 74.9 |
| Medium Trucks: | 75.4 | 73.6 | 67.5 | 68.3 | 75.8 | 75.9 |
| Heavy Trucks: | 77.8 | 76.3 | 67.3 | 69.4 | 77.4 | 77.5 |
| Vehicle Noise: | 80.8 | 79.1 | 72.8 | 73.2 | 80.8 | 81.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 211 | 454 | 979 | 2,108 |
| CNEL: | 217 | 467 | 1,006 | 2,167 |

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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,969 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,197 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.54 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.19 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.61 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.5 | 70.3 | 67.4 | 65.6 | 73.0 | 73.3 |
| Medium Trucks: | 73.8 | 72.0 | 65.9 | 66.7 | 74.1 | 74.3 |
| Heavy Trucks: | 76.2 | 74.7 | 65.7 | 67.8 | 75.8 | 75.9 |
| Vehicle Noise: | 79.2 | 77.5 | 71.2 | 71.6 | 79.2 | 79.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 165 | 355 | 765 | 1,648 |
| CNEL: | 169 | 365 | 786 | 1,694 |

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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 26,801 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,680 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.77 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.95 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.37 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.8 | 69.6 | 66.6 | 64.9 | 72.2 | 72.5 |
| Medium Trucks: | 73.1 | 71.2 | 65.1 | 66.0 | 73.4 | 73.6 |
| Heavy Trucks: | 75.5 | 73.9 | 65.0 | 67.1 | 75.0 | 75.1 |
| Vehicle Noise: | 78.5 | 76.7 | 70.4 | 70.8 | 78.5 | 78.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 147 | 316 | 680 | 1,465 |
| CNEL: | 151 | 325 | 699 | 1,506 |



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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 25,978 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,598 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.64 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.09 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.51 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.6 | 69.4 | 66.5 | 64.7 | 72.1 | 72.4 |
| Medium Trucks: | 72.9 | 71.1 | 65.0 | 65.8 | 73.2 | 73.4 |
| Heavy Trucks: | 75.3 | 73.8 | 64.8 | 66.9 | 74.9 | 75.0 |
| Vehicle Noise: | 78.3 | 76.6 | 70.3 | 70.7 | 78.3 | 78.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 144 | 309 | 666 | 1,435 |
| CNEL: | 148 | 318 | 685 | 1,475 |



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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 50,172 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 5,017 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.49 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.23 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.65 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.5 | 72.3 | 69.3 | 67.6 | 74.9 | 75.2 |
| Medium Trucks: | 75.8 | 73.9 | 67.8 | 68.7 | 76.1 | 76.3 |
| Heavy Trucks: | 78.2 | 76.6 | 67.7 | 69.8 | 77.7 | 77.9 |
| Vehicle Noise: | 81.2 | 79.4 | 73.1 | 73.5 | 81.2 | 81.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 223 | 480 | 1,033 | 2,226 |
| CNEL: | 229 | 493 | 1,062 | 2,288 |



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

Scenario: OY 2020 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 37,273 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,727 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.20 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.52 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.94 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.2 | 71.0 | 68.0 | 66.3 | 73.6 | 73.9 |
| Medium Trucks: | 74.5 | 72.6 | 66.5 | 67.4 | 74.8 | 75.0 |
| Heavy Trucks: | 76.9 | 75.4 | 66.4 | 68.5 | 76.4 | 76.6 |
| Vehicle Noise: | 79.9 | 78.1 | 71.8 | 72.3 | 79.9 | 80.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 183 | 393 | 848 | 1,826 |
| CNEL: | 188 | 404 | 871 | 1,877 |

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

Scenario: OY 2020 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,971 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,197 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.54 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.19 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.61 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.9 | 70.7 | 67.8 | 66.0 | 73.4 | 73.7 |
| Medium Trucks: | 74.3 | 72.4 | 66.3 | 67.2 | 74.6 | 74.7 |
| Heavy Trucks: | 76.6 | 75.1 | 66.1 | 68.2 | 76.2 | 76.3 |
| Vehicle Noise: | 79.7 | 77.9 | 71.6 | 72.0 | 79.6 | 79.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 220 | 473 | 1,019 | 2,196 |
| CNEL: | 226 | 486 | 1,048 | 2,257 |



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

Scenario: OY 2020 Without Project
Road Name: Live Oak Av.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 34,512 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,451 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.87 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.86 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.28 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.3 | 71.1 | 68.1 | 66.4 | 73.7 | 74.0 |
| Medium Trucks: | 74.6 | 72.7 | 66.6 | 67.5 | 74.9 | 75.1 |
| Heavy Trucks: | 77.0 | 75.4 | 66.5 | 68.6 | 76.5 | 76.6 |
| Vehicle Noise: | 80.0 | 78.2 | 71.9 | 72.3 | 80.0 | 80.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 231 | 498 | 1,073 | 2,311 |
| CNEL: | 238 | 512 | 1,103 | 2,375 |



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

Scenario: OY 2020 Without Project
Road Name: Live Oak Av.
Road Segment: e/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,071 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,307 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.68 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.04 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.46 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.1 | 70.9 | 67.9 | 66.2 | 73.5 | 73.8 |
| Medium Trucks: | 74.4 | 72.5 | 66.4 | 67.3 | 74.7 | 74.9 |
| Heavy Trucks: | 76.8 | 75.3 | 66.3 | 68.4 | 76.3 | 76.5 |
| Vehicle Noise: | 79.8 | 78.0 | 71.7 | 72.2 | 79.8 | 80.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 225 | 484 | 1,043 | 2,246 |
| CNEL: | 231 | 497 | 1,072 | 2,309 |



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

Scenario: OY 2020 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 29,041 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,904 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.12 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.61 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.03 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.5 | 70.3 | 67.4 | 65.6 | 73.0 | 73.3 |
| Medium Trucks: | 73.8 | 72.0 | 65.9 | 66.7 | 74.2 | 74.3 |
| Heavy Trucks: | 76.2 | 74.7 | 65.7 | 67.8 | 75.8 | 75.9 |
| Vehicle Noise: | 79.2 | 77.5 | 71.2 | 71.6 | 79.2 | 79.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 206 | 444 | 956 | 2,060 |
| CNEL: | 212 | 456 | 983 | 2,117 |

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

Scenario: OY 2020 With Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 28,464 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 2,846 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.00% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.90% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.10% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.56 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.29 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.71 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.1 | 68.9 | 66.0 | 64.2 | 71.6 | 71.9 |
| Medium Trucks: | 72.6 | 70.7 | 64.6 | 65.4 | 72.9 | 73.0 |
| Heavy Trucks: | 75.4 | 73.9 | 64.9 | 67.0 | 75.0 | 75.1 |
| Vehicle Noise: | 78.2 | 76.4 | 70.0 | 70.5 | 78.1 | 78.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 105 | 225 | 486 | 1,046 |
| CNEL: | 108 | 232 | 499 | 1,075 |

Wednesday, May 02, 2018

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

Scenario: OY 2020 With Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 23,925 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 2,392 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 56 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 60.0 feet |
| Centerline Dist. to Observer: | 60.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.06% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.86% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.08% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.81 | -0.52 | -1.20 | -4.69 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.06 | -0.50 | -1.20 | -4.88 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.48 | -0.50 | -1.20 | -5.34 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.6 | 64.4 | 61.4 | 59.7 | 67.0 | 67.4 |
| Medium Trucks: | 68.0 | 66.1 | 60.0 | 60.8 | 68.3 | 68.4 |
| Heavy Trucks: | 70.8 | 69.3 | 60.3 | 62.4 | 70.4 | 70.5 |
| Vehicle Noise: | 73.6 | 71.8 | 65.4 | 65.9 | 73.6 | 73.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 104 | 223 | 480 | 1,035 |
| CNEL: | 106 | 229 | 494 | 1,063 |

Wednesday, May 02, 2018

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

Scenario: OY 2020 With Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 7,547 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 755 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.96% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.29% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.75% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -3.15 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.36 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.78 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.4 | 63.2 | 60.3 | 58.5 | 65.9 | 66.2 |
| Medium Trucks: | 66.5 | 64.6 | 58.5 | 59.4 | 66.8 | 67.0 |
| Heavy Trucks: | 69.3 | 67.8 | 58.8 | 60.9 | 68.9 | 69.0 |
| Vehicle Noise: | 72.2 | 70.4 | 64.0 | 64.5 | 72.1 | 72.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 42 | 90 | 194 | 417 |
| CNEL: | 43 | 92 | 199 | 429 |

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

Scenario: OY 2020 With Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 18,136 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,814 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.20% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.78% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.03% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.61 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.31 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.73 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.2 | 67.0 | 64.0 | 62.3 | 69.6 | 69.9 |
| Medium Trucks: | 70.5 | 68.7 | 62.6 | 63.4 | 70.8 | 71.0 |
| Heavy Trucks: | 73.4 | 71.9 | 62.9 | 65.0 | 73.0 | 73.1 |
| Vehicle Noise: | 76.2 | 74.4 | 68.0 | 68.5 | 76.1 | 76.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 77 | 166 | 357 | 769 |
| CNEL: | 79 | 170 | 367 | 790 |

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

Scenario: OY 2020 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 11,148 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,115 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 89.56% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 6.64% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 3.80% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -1.33 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -12.63 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.05 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 67.2 | 65.1 | 62.1 | 60.3 | 67.7 | 68.0 |
| Medium Trucks: | 67.2 | 65.3 | 59.2 | 60.1 | 67.5 | 67.7 |
| Heavy Trucks: | 70.1 | 68.5 | 59.6 | 61.7 | 69.6 | 69.7 |
| Vehicle Noise: | 73.2 | 71.4 | 65.3 | 65.5 | 73.2 | 73.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 49 | 105 | 226 | 487 |
| CNEL: | 50 | 108 | 233 | 501 |



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

Scenario: OY 2020 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 5,726 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 573 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 93.26% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 4.29% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 2.46% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -4.05 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.43 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -19.85 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.5 | 62.3 | 59.4 | 57.6 | 65.0 | 65.3 |
| Medium Trucks: | 62.4 | 60.5 | 54.4 | 55.3 | 62.7 | 62.9 |
| Heavy Trucks: | 65.3 | 63.7 | 54.8 | 56.9 | 64.8 | 64.9 |
| Vehicle Noise: | 69.0 | 67.2 | 61.6 | 61.5 | 69.1 | 69.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 26 | 56 | 121 | 260 |
| CNEL: | 27 | 58 | 124 | 268 |



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

Scenario: OY 2020 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 15,225 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,522 vehicles |
| Vehicle Speed: | 50 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.17% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.79% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.04% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -1.12 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -11.03 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -13.45 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.2 | 69.0 | 66.0 | 64.3 | 71.6 | 71.9 |
| Medium Trucks: | 72.1 | 70.2 | 64.1 | 65.0 | 72.4 | 72.6 |
| Heavy Trucks: | 74.1 | 72.5 | 63.6 | 65.7 | 73.6 | 73.7 |
| Vehicle Noise: | 77.4 | 75.6 | 69.5 | 69.8 | 77.4 | 77.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 93 | 201 | 433 | 933 |
| CNEL: | 96 | 207 | 446 | 960 |



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

Scenario: OY 2020 With Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 7,461 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 746 vehicles |
| Vehicle Speed: | 30 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.98% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.28% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.74% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -1.95 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -12.17 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -14.59 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 60.0 | 57.8 | 54.8 | 53.1 | 60.4 | 60.7 |
| Medium Trucks: | 61.5 | 59.6 | 53.5 | 54.4 | 61.8 | 62.0 |
| Heavy Trucks: | 65.5 | 64.0 | 55.0 | 57.1 | 65.1 | 65.2 |
| Vehicle Noise: | 67.8 | 66.1 | 59.3 | 60.0 | 67.7 | 67.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 28 | 60 | 130 | 280 |
| CNEL: | 29 | 62 | 133 | 287 |

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

Scenario: OY 2020 With Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 14,109 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,411 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 50.0 feet |
| Centerline Dist. to Observer: | 50.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.35% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.68% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.97% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.47 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.45 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.87 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.6 | 63.4 | 60.4 | 58.7 | 66.0 | 66.3 |
| Medium Trucks: | 66.8 | 64.9 | 58.8 | 59.7 | 67.1 | 67.3 |
| Heavy Trucks: | 69.7 | 68.1 | 59.2 | 61.3 | 69.2 | 69.3 |
| Vehicle Noise: | 72.5 | 70.7 | 64.3 | 64.8 | 72.4 | 72.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 73 | 156 | 337 | 726 |
| CNEL: | 75 | 161 | 346 | 746 |

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

Scenario: OY 2020 With Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 12,415 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,241 vehicles |
| Vehicle Speed: | 35 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.45% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.62% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.94% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -0.44 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -10.45 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -12.87 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.0 | 61.8 | 58.9 | 57.1 | 64.5 | 64.8 |
| Medium Trucks: | 65.5 | 63.6 | 57.5 | 58.4 | 65.8 | 66.0 |
| Heavy Trucks: | 68.9 | 67.4 | 58.4 | 60.5 | 68.5 | 68.6 |
| Vehicle Noise: | 71.4 | 69.7 | 63.1 | 63.7 | 71.3 | 71.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 49 | 106 | 228 | 492 |
| CNEL: | 50 | 109 | 234 | 505 |

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

Scenario: OY 2020 With Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 15,246 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,525 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.30% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.71% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.99% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.13 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.09 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.51 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.4 | 66.3 | 63.3 | 61.5 | 68.9 | 69.2 |
| Medium Trucks: | 69.8 | 67.9 | 61.8 | 62.6 | 70.1 | 70.2 |
| Heavy Trucks: | 72.6 | 71.1 | 62.1 | 64.2 | 72.2 | 72.3 |
| Vehicle Noise: | 75.4 | 73.6 | 67.2 | 67.7 | 75.4 | 75.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 68 | 147 | 317 | 683 |
| CNEL: | 70 | 151 | 326 | 702 |

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

Scenario: OY 2020 With Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 19,975 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,997 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.64% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.49% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.86% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.06 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.03 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.45 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.6 | 67.4 | 64.5 | 62.7 | 70.1 | 70.4 |
| Medium Trucks: | 70.8 | 68.9 | 62.8 | 63.7 | 71.1 | 71.3 |
| Heavy Trucks: | 73.7 | 72.1 | 63.2 | 65.3 | 73.2 | 73.3 |
| Vehicle Noise: | 76.5 | 74.7 | 68.3 | 68.8 | 76.5 | 76.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 81 | 174 | 375 | 807 |
| CNEL: | 83 | 179 | 385 | 830 |

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

Scenario: OY 2020 With Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,597 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,860 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 48.0 | feet |
| Centerline Dist. to Observer: | 48.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.93% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.91% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.17% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.58 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.26 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.63 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.9 | 66.8 | 63.8 | 62.0 | 69.4 | 69.7 |
| Medium Trucks: | 70.3 | 68.4 | 62.4 | 63.2 | 70.6 | 70.8 |
| Heavy Trucks: | 73.2 | 71.7 | 62.8 | 64.8 | 72.8 | 72.9 |
| Vehicle Noise: | 76.0 | 74.2 | 67.8 | 68.3 | 76.0 | 76.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 120 | 258 | 555 | 1,197 |
| CNEL: | 123 | 265 | 571 | 1,229 |

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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,321 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,832 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.28% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.68% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.04% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.04 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.93 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.29 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.0 | 69.8 | 66.9 | 65.1 | 72.5 | 72.8 |
| Medium Trucks: | 73.1 | 71.2 | 65.1 | 66.0 | 73.4 | 73.6 |
| Heavy Trucks: | 75.5 | 74.0 | 65.0 | 67.1 | 75.1 | 75.2 |
| Vehicle Noise: | 78.6 | 76.8 | 70.5 | 70.9 | 78.6 | 78.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 149 | 321 | 692 | 1,490 |
| CNEL: | 153 | 330 | 711 | 1,532 |

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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 49,037 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,904 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.42% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.61% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.97% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.43 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.58 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.97 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.4 | 72.2 | 69.3 | 67.5 | 74.9 | 75.2 |
| Medium Trucks: | 75.4 | 73.6 | 67.5 | 68.3 | 75.8 | 75.9 |
| Heavy Trucks: | 77.9 | 76.3 | 67.4 | 69.5 | 77.4 | 77.5 |
| Vehicle Noise: | 80.9 | 79.2 | 72.9 | 73.3 | 80.9 | 81.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 214 | 460 | 992 | 2,137 |
| CNEL: | 220 | 473 | 1,020 | 2,198 |

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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 36,385 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,638 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.39% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.02% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.59% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.19 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.19 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.61 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.2 | 71.0 | 68.0 | 66.3 | 73.6 | 73.9 |
| Medium Trucks: | 73.8 | 72.0 | 65.9 | 66.7 | 74.1 | 74.3 |
| Heavy Trucks: | 76.2 | 74.7 | 65.7 | 67.8 | 75.8 | 75.9 |
| Vehicle Noise: | 79.4 | 77.6 | 71.4 | 71.8 | 79.4 | 79.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 169 | 364 | 784 | 1,690 |
| CNEL: | 174 | 375 | 807 | 1,738 |

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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,217 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,122 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.68% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 7.83% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.49% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.54 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.95 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.37 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.5 | 70.3 | 67.4 | 65.6 | 73.0 | 73.3 |
| Medium Trucks: | 73.1 | 71.2 | 65.1 | 66.0 | 73.4 | 73.6 |
| Heavy Trucks: | 75.5 | 73.9 | 65.0 | 67.1 | 75.0 | 75.1 |
| Vehicle Noise: | 78.6 | 76.9 | 70.7 | 71.0 | 78.7 | 78.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 151 | 325 | 701 | 1,510 |
| CNEL: | 155 | 335 | 721 | 1,553 |



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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 27,358 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,736 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.37% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.66% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.96% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.90 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -8.09 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.51 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.9 | 69.7 | 66.7 | 65.0 | 72.3 | 72.6 |
| Medium Trucks: | 72.9 | 71.1 | 65.0 | 65.8 | 73.2 | 73.4 |
| Heavy Trucks: | 75.3 | 73.8 | 64.8 | 66.9 | 74.9 | 75.0 |
| Vehicle Noise: | 78.4 | 76.6 | 70.4 | 70.8 | 78.4 | 78.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 145 | 312 | 673 | 1,449 |
| CNEL: | 149 | 321 | 692 | 1,490 |



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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 51,552 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 5,155 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.04% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.88% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.09% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.63 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.23 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.65 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.6 | 72.4 | 69.5 | 67.7 | 75.1 | 75.4 |
| Medium Trucks: | 75.8 | 73.9 | 67.8 | 68.7 | 76.1 | 76.3 |
| Heavy Trucks: | 78.2 | 76.6 | 67.7 | 69.8 | 77.7 | 77.9 |
| Vehicle Noise: | 81.2 | 79.5 | 73.2 | 73.6 | 81.2 | 81.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 224 | 482 | 1,038 | 2,237 |
| CNEL: | 230 | 496 | 1,068 | 2,300 |



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

Scenario: OY 2020 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 38,117 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,812 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.93% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.93% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.14% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.31 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.52 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.91 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.3 | 71.1 | 68.1 | 66.4 | 73.7 | 74.1 |
| Medium Trucks: | 74.5 | 72.6 | 66.5 | 67.4 | 74.8 | 75.0 |
| Heavy Trucks: | 76.9 | 75.4 | 66.4 | 68.5 | 76.5 | 76.6 |
| Vehicle Noise: | 79.9 | 78.2 | 71.9 | 72.3 | 79.9 | 80.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 184 | 396 | 853 | 1,837 |
| CNEL: | 189 | 407 | 877 | 1,889 |

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

Scenario: OY 2020 With Project
Road Name: Live Oak Av.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,919 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,392 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.43% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.61% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.96% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.83 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.18 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.57 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.2 | 71.0 | 68.1 | 66.3 | 73.7 | 74.0 |
| Medium Trucks: | 74.3 | 72.4 | 66.3 | 67.2 | 74.6 | 74.7 |
| Heavy Trucks: | 76.7 | 75.1 | 66.2 | 68.3 | 76.2 | 76.3 |
| Vehicle Noise: | 79.7 | 78.0 | 71.7 | 72.1 | 79.7 | 79.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 223 | 480 | 1,033 | 2,226 |
| CNEL: | 229 | 493 | 1,062 | 2,289 |

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

Scenario: OY 2020 With Project
Road Name: Live Oak Av.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 35,908 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,591 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.16% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.78% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.06% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.07 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.85 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.24 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.5 | 71.3 | 68.3 | 66.6 | 73.9 | 74.2 |
| Medium Trucks: | 74.6 | 72.7 | 66.6 | 67.5 | 74.9 | 75.1 |
| Heavy Trucks: | 77.0 | 75.5 | 66.5 | 68.6 | 76.6 | 76.7 |
| Vehicle Noise: | 80.0 | 78.3 | 72.0 | 72.4 | 80.0 | 80.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 233 | 503 | 1,083 | 2,333 |
| CNEL: | 240 | 517 | 1,113 | 2,399 |

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

Scenario: OY 2020 With Project
Road Name: Live Oak Av.
Road Segment: e/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,777 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,378 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.90% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.94% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.16% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.79 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.04 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.43 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.2 | 71.0 | 68.0 | 66.3 | 73.6 | 73.9 |
| Medium Trucks: | 74.4 | 72.5 | 66.4 | 67.3 | 74.7 | 74.9 |
| Heavy Trucks: | 76.8 | 75.3 | 66.3 | 68.4 | 76.4 | 76.5 |
| Vehicle Noise: | 79.8 | 78.1 | 71.8 | 72.2 | 79.8 | 80.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 226 | 487 | 1,049 | 2,260 |
| CNEL: | 232 | 501 | 1,078 | 2,324 |

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

Scenario: OY 2020 With Project
Road Name: Live Oak Av.
Road Segment: w/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 29,747 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,975 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.94% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.92% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.15% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.24 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.60 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.99 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.6 | 70.4 | 67.5 | 65.7 | 73.1 | 73.4 |
| Medium Trucks: | 73.8 | 72.0 | 65.9 | 66.7 | 74.2 | 74.3 |
| Heavy Trucks: | 76.3 | 74.7 | 65.8 | 67.9 | 75.8 | 75.9 |
| Vehicle Noise: | 79.3 | 77.5 | 71.2 | 71.6 | 79.3 | 79.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 207 | 447 | 963 | 2,074 |
| CNEL: | 213 | 459 | 990 | 2,133 |

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

Scenario: HY 2040 Without Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 29,493 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 2,949 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.70 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.03 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.45 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.3 | 69.1 | 66.1 | 64.4 | 71.7 | 72.0 |
| Medium Trucks: | 72.8 | 70.9 | 64.8 | 65.7 | 73.1 | 73.3 |
| Heavy Trucks: | 75.7 | 74.1 | 65.2 | 67.3 | 75.2 | 75.3 |
| Vehicle Noise: | 78.4 | 76.7 | 70.2 | 70.7 | 78.4 | 78.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 108 | 234 | 503 | 1,085 |
| CNEL: | 111 | 240 | 517 | 1,114 |

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

Scenario: HY 2040 Without Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 23,383 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 2,338 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 56 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 60.0 feet |
| Centerline Dist. to Observer: | 60.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.69 | -0.52 | -1.20 | -4.69 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.04 | -0.50 | -1.20 | -4.88 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.46 | -0.50 | -1.20 | -5.34 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.5 | 64.3 | 61.3 | 59.6 | 66.9 | 67.2 |
| Medium Trucks: | 68.0 | 66.1 | 60.0 | 60.9 | 68.3 | 68.5 |
| Heavy Trucks: | 70.8 | 69.3 | 60.3 | 62.4 | 70.4 | 70.5 |
| Vehicle Noise: | 73.6 | 71.8 | 65.4 | 65.9 | 73.5 | 73.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 103 | 223 | 480 | 1,034 |
| CNEL: | 106 | 229 | 493 | 1,062 |

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

Scenario: HY 2040 Without Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 7,265 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 727 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -3.39 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.11 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.53 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.2 | 63.0 | 60.0 | 58.3 | 65.6 | 65.9 |
| Medium Trucks: | 66.7 | 64.8 | 58.8 | 59.6 | 67.0 | 67.2 |
| Heavy Trucks: | 69.6 | 68.1 | 59.1 | 61.2 | 69.1 | 69.3 |
| Vehicle Noise: | 72.3 | 70.6 | 64.1 | 64.6 | 72.3 | 72.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 43 | 92 | 198 | 426 |
| CNEL: | 44 | 94 | 203 | 438 |

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

Scenario: HY 2040 Without Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 18,485 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,849 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.67 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.06 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.48 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.2 | 67.1 | 64.1 | 62.4 | 69.7 | 70.0 |
| Medium Trucks: | 70.8 | 68.9 | 62.8 | 63.7 | 71.1 | 71.3 |
| Heavy Trucks: | 73.6 | 72.1 | 63.1 | 65.2 | 73.2 | 73.3 |
| Vehicle Noise: | 76.4 | 74.6 | 68.2 | 68.7 | 76.3 | 76.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 79 | 171 | 369 | 794 |
| CNEL: | 82 | 176 | 379 | 816 |

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

Scenario: HY 2040 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 8,469 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 847 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -2.72 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -12.45 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -14.87 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.9 | 63.7 | 60.7 | 59.0 | 66.3 | 66.6 |
| Medium Trucks: | 67.4 | 65.5 | 59.4 | 60.3 | 67.7 | 67.9 |
| Heavy Trucks: | 70.3 | 68.7 | 59.8 | 61.8 | 69.8 | 69.9 |
| Vehicle Noise: | 73.0 | 71.2 | 64.8 | 65.3 | 73.0 | 73.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 47 | 102 | 219 | 472 |
| CNEL: | 48 | 104 | 225 | 485 |

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

Scenario: HY 2040 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 2,859 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 286 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -7.44 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.16 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -19.58 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 61.1 | 58.9 | 56.0 | 54.2 | 61.6 | 61.9 |
| Medium Trucks: | 62.7 | 60.8 | 54.7 | 55.6 | 63.0 | 63.2 |
| Heavy Trucks: | 65.5 | 64.0 | 55.0 | 57.1 | 65.1 | 65.2 |
| Vehicle Noise: | 68.3 | 66.5 | 60.0 | 60.6 | 68.2 | 68.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 23 | 49 | 106 | 229 |
| CNEL: | 24 | 51 | 109 | 235 |

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

Scenario: HY 2040 Without Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 15,407 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 1,541 vehicles |
| Vehicle Speed: | 50 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 30.0 feet |
| Centerline Dist. to Observer: | 30.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -1.09 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -10.82 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -13.24 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.2 | 69.0 | 66.0 | 64.3 | 71.6 | 71.9 |
| Medium Trucks: | 72.3 | 70.4 | 64.3 | 65.2 | 72.6 | 72.8 |
| Heavy Trucks: | 74.3 | 72.7 | 63.8 | 65.9 | 73.8 | 73.9 |
| Vehicle Noise: | 77.5 | 75.8 | 69.6 | 69.9 | 77.6 | 77.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 96 | 206 | 444 | 957 |
| CNEL: | 98 | 212 | 457 | 984 |

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

Scenario: HY 2040 Without Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 7,154 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 715 vehicles |
| Vehicle Speed: | 30 mph |
| Near/Far Lane Distance: | 12 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -2.20 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -11.93 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -14.35 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 59.7 | 57.5 | 54.6 | 52.8 | 60.2 | 60.5 |
| Medium Trucks: | 61.8 | 59.9 | 53.8 | 54.7 | 62.1 | 62.2 |
| Heavy Trucks: | 65.8 | 64.2 | 55.3 | 57.4 | 65.3 | 65.5 |
| Vehicle Noise: | 67.9 | 66.2 | 59.4 | 60.1 | 67.8 | 68.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 29 | 62 | 133 | 287 |
| CNEL: | 29 | 63 | 136 | 294 |

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

Scenario: HY 2040 Without Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 14,196 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,420 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.48 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.20 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.62 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.5 | 63.4 | 60.4 | 58.6 | 66.0 | 66.3 |
| Medium Trucks: | 67.0 | 65.2 | 59.1 | 59.9 | 67.4 | 67.5 |
| Heavy Trucks: | 69.9 | 68.4 | 59.4 | 61.5 | 69.5 | 69.6 |
| Vehicle Noise: | 72.7 | 70.9 | 64.4 | 65.0 | 72.6 | 72.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 75 | 161 | 347 | 747 |
| CNEL: | 77 | 165 | 356 | 767 |

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

Scenario: HY 2040 Without Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 12,397 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,240 | vehicles |
| Vehicle Speed: | 35 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -0.49 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -10.21 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -12.63 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.0 | 61.8 | 58.8 | 57.1 | 64.4 | 64.7 |
| Medium Trucks: | 65.7 | 63.9 | 57.8 | 58.6 | 66.1 | 66.2 |
| Heavy Trucks: | 69.1 | 67.6 | 58.6 | 60.7 | 68.7 | 68.8 |
| Vehicle Noise: | 71.6 | 69.9 | 63.2 | 63.9 | 71.5 | 71.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 51 | 109 | 235 | 506 |
| CNEL: | 52 | 112 | 241 | 519 |

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

Scenario: HY 2040 Without Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 15,446 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,545 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.11 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.84 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.26 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.5 | 66.3 | 63.3 | 61.6 | 68.9 | 69.2 |
| Medium Trucks: | 70.0 | 68.1 | 62.0 | 62.9 | 70.3 | 70.5 |
| Heavy Trucks: | 72.9 | 71.3 | 62.4 | 64.5 | 72.4 | 72.5 |
| Vehicle Noise: | 75.6 | 73.9 | 67.4 | 67.9 | 75.6 | 75.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 70 | 152 | 327 | 705 |
| CNEL: | 72 | 156 | 336 | 724 |

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

Scenario: HY 2040 Without Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 19,716 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,972 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.95 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.78 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.20 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.5 | 67.3 | 64.4 | 62.6 | 70.0 | 70.3 |
| Medium Trucks: | 71.1 | 69.2 | 63.1 | 64.0 | 71.4 | 71.5 |
| Heavy Trucks: | 73.9 | 72.4 | 63.4 | 65.5 | 73.5 | 73.6 |
| Vehicle Noise: | 76.7 | 74.9 | 68.4 | 69.0 | 76.6 | 76.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 83 | 179 | 385 | 829 |
| CNEL: | 85 | 184 | 395 | 852 |

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

Scenario: HY 2040 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 29,553 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,955 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 48.0 | feet |
| Centerline Dist. to Observer: | 48.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.71 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.02 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.44 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.1 | 66.9 | 63.9 | 62.2 | 69.5 | 69.8 |
| Medium Trucks: | 70.6 | 68.7 | 62.6 | 63.5 | 70.9 | 71.1 |
| Heavy Trucks: | 73.4 | 71.9 | 62.9 | 65.0 | 73.0 | 73.1 |
| Vehicle Noise: | 76.2 | 74.4 | 68.0 | 68.5 | 76.1 | 76.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 123 | 266 | 572 | 1,233 |
| CNEL: | 127 | 273 | 588 | 1,267 |

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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,500 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,850 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.04 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.69 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.11 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.0 | 69.8 | 66.9 | 65.1 | 72.5 | 72.8 |
| Medium Trucks: | 73.3 | 71.5 | 65.4 | 66.2 | 73.7 | 73.8 |
| Heavy Trucks: | 75.7 | 74.2 | 65.2 | 67.3 | 75.3 | 75.4 |
| Vehicle Noise: | 78.7 | 77.0 | 70.7 | 71.1 | 78.7 | 78.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 153 | 329 | 709 | 1,527 |
| CNEL: | 157 | 338 | 728 | 1,569 |

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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 48,995 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,900 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.39 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.33 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.75 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.4 | 72.2 | 69.2 | 67.5 | 74.8 | 75.1 |
| Medium Trucks: | 75.7 | 73.8 | 67.7 | 68.6 | 76.0 | 76.2 |
| Heavy Trucks: | 78.1 | 76.5 | 67.6 | 69.7 | 77.6 | 77.8 |
| Vehicle Noise: | 81.1 | 79.3 | 73.0 | 73.4 | 81.1 | 81.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 219 | 472 | 1,017 | 2,191 |
| CNEL: | 225 | 485 | 1,045 | 2,252 |

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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,799 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,380 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.78 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.95 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.37 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.8 | 70.6 | 67.6 | 65.9 | 73.2 | 73.5 |
| Medium Trucks: | 74.1 | 72.2 | 66.1 | 67.0 | 74.4 | 74.6 |
| Heavy Trucks: | 76.5 | 74.9 | 66.0 | 68.1 | 76.0 | 76.1 |
| Vehicle Noise: | 79.5 | 77.7 | 71.4 | 71.8 | 79.5 | 79.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 171 | 369 | 794 | 1,711 |
| CNEL: | 176 | 379 | 816 | 1,758 |

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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,411 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,841 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.02 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.70 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.12 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.0 | 69.8 | 66.9 | 65.1 | 72.5 | 72.8 |
| Medium Trucks: | 73.3 | 71.4 | 65.3 | 66.2 | 73.6 | 73.8 |
| Heavy Trucks: | 75.7 | 74.2 | 65.2 | 67.3 | 75.3 | 75.4 |
| Vehicle Noise: | 78.7 | 77.0 | 70.6 | 71.1 | 78.7 | 78.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 152 | 328 | 707 | 1,524 |
| CNEL: | 157 | 337 | 727 | 1,566 |



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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 27,384 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,738 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 1.86 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.86 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.28 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.9 | 69.7 | 66.7 | 65.0 | 72.3 | 72.6 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.6 |
| Heavy Trucks: | 75.5 | 74.0 | 65.1 | 67.1 | 75.1 | 75.2 |
| Vehicle Noise: | 78.6 | 76.8 | 70.5 | 70.9 | 78.6 | 78.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 149 | 320 | 690 | 1,487 |
| CNEL: | 153 | 329 | 709 | 1,528 |



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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 53,119 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 5,312 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.74 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -4.98 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.40 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.7 | 72.5 | 69.6 | 67.8 | 75.2 | 75.5 |
| Medium Trucks: | 76.0 | 74.2 | 68.1 | 68.9 | 76.4 | 76.5 |
| Heavy Trucks: | 78.4 | 76.9 | 67.9 | 70.0 | 78.0 | 78.1 |
| Vehicle Noise: | 81.4 | 79.7 | 73.4 | 73.8 | 81.4 | 81.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 231 | 498 | 1,073 | 2,312 |
| CNEL: | 238 | 512 | 1,103 | 2,377 |



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

Scenario: HY 2040 Without Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 39,460 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,946 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.45 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.27 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.69 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.4 | 71.2 | 68.3 | 66.5 | 73.9 | 74.2 |
| Medium Trucks: | 74.8 | 72.9 | 66.8 | 67.6 | 75.1 | 75.2 |
| Heavy Trucks: | 77.1 | 75.6 | 66.6 | 68.7 | 76.7 | 76.8 |
| Vehicle Noise: | 80.2 | 78.4 | 72.1 | 72.5 | 80.1 | 80.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 190 | 409 | 880 | 1,897 |
| CNEL: | 195 | 420 | 905 | 1,950 |

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

Scenario: HY 2040 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 33,801 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,380 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.78 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.95 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.37 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.2 | 71.0 | 68.0 | 66.3 | 73.6 | 73.9 |
| Medium Trucks: | 74.5 | 72.6 | 66.5 | 67.4 | 74.8 | 75.0 |
| Heavy Trucks: | 76.9 | 75.3 | 66.4 | 68.5 | 76.4 | 76.6 |
| Vehicle Noise: | 79.9 | 78.1 | 71.8 | 72.2 | 79.9 | 80.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 228 | 491 | 1,058 | 2,279 |
| CNEL: | 234 | 505 | 1,087 | 2,343 |

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

Scenario: HY 2040 Without Project
Road Name: Live Oak Av.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 36,535 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,654 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.12 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.61 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.03 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.5 | 71.3 | 68.4 | 66.6 | 74.0 | 74.3 |
| Medium Trucks: | 74.8 | 73.0 | 66.9 | 67.7 | 75.1 | 75.3 |
| Heavy Trucks: | 77.2 | 75.7 | 66.7 | 68.8 | 76.8 | 76.9 |
| Vehicle Noise: | 80.2 | 78.5 | 72.1 | 72.6 | 80.2 | 80.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 240 | 517 | 1,114 | 2,400 |
| CNEL: | 247 | 532 | 1,145 | 2,467 |

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

Scenario: HY 2040 Without Project
Road Name: Live Oak Av.
Road Segment: e/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 35,031 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,503 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.93 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.79 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.21 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.3 | 71.1 | 68.2 | 66.4 | 73.8 | 74.1 |
| Medium Trucks: | 74.7 | 72.8 | 66.7 | 67.5 | 75.0 | 75.1 |
| Heavy Trucks: | 77.0 | 75.5 | 66.5 | 68.6 | 76.6 | 76.7 |
| Vehicle Noise: | 80.1 | 78.3 | 72.0 | 72.4 | 80.0 | 80.2 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 233 | 503 | 1,083 | 2,334 |
| CNEL: | 240 | 517 | 1,114 | 2,399 |

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

Scenario: HY 2040 Without Project
Road Name: Live Oak Av.
Road Segment: w/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 30,712 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,071 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.65% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 9.12% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.23% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.36 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.36 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.78 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.8 | 70.6 | 67.6 | 65.9 | 73.2 | 73.5 |
| Medium Trucks: | 74.1 | 72.2 | 66.1 | 67.0 | 74.4 | 74.6 |
| Heavy Trucks: | 76.5 | 74.9 | 66.0 | 68.1 | 76.0 | 76.1 |
| Vehicle Noise: | 79.5 | 77.7 | 71.4 | 71.8 | 79.5 | 79.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 214 | 461 | 992 | 2,138 |
| CNEL: | 220 | 473 | 1,020 | 2,198 |

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

Scenario: HY 2040 With Project
Road Name: Myrtle Av.
Road Segment: n/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 30,183 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,018 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.98% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.91% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.11% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.82 | 3.26 | -1.20 | *-4.49* | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.03 | 3.33 | -1.20 | *-4.86* | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.45 | 3.32 | -1.20 | *-5.77* | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.4 | 69.2 | 66.2 | 64.5 | 71.8 | 72.1 |
| Medium Trucks: | 72.8 | 70.9 | 64.8 | 65.7 | 73.1 | 73.3 |
| Heavy Trucks: | 75.7 | 74.1 | 65.2 | 67.3 | 75.2 | 75.3 |
| Vehicle Noise: | 78.4 | 76.7 | 70.2 | 70.7 | 78.4 | 78.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 109 | 235 | 505 | 1,089 |
| CNEL: | 112 | 241 | 519 | 1,119 |

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

Scenario: HY 2040 With Project
Road Name: Peck Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 24,073 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,407 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 56 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 60.0 | feet |
| Centerline Dist. to Observer: | 60.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.06% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.86% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.08% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 53.301 |
| Medium Trucks: | 53.135 |
| Heavy Trucks: | 53.151 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.84 | -0.52 | -1.20 | *-4.69* | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.04 | -0.50 | -1.20 | *-4.88* | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -10.46 | -0.50 | -1.20 | *-5.34* | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 66.6 | 64.4 | 61.5 | 59.7 | 67.1 | 67.4 |
| Medium Trucks: | 68.0 | 66.1 | 60.0 | 60.9 | 68.3 | 68.5 |
| Heavy Trucks: | 70.8 | 69.3 | 60.3 | 62.4 | 70.4 | 70.5 |
| Vehicle Noise: | 73.6 | 71.9 | 65.4 | 65.9 | 73.6 | 73.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 104 | 224 | 482 | 1,039 |
| CNEL: | 107 | 230 | 496 | 1,068 |

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

Scenario: HY 2040 With Project
Road Name: Avenida Barbosa
Road Segment: n/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 7,955 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 795 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.90% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.33% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.77% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -2.93 | 3.26 | -1.20 | *-4.49* | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -13.11 | 3.33 | -1.20 | *-4.86* | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -15.53 | 3.32 | -1.20 | *-5.77* | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.6 | 63.5 | 60.5 | 58.8 | 66.1 | 66.4 |
| Medium Trucks: | 66.7 | 64.8 | 58.8 | 59.6 | 67.0 | 67.2 |
| Heavy Trucks: | 69.6 | 68.1 | 59.1 | 61.2 | 69.1 | 69.3 |
| Vehicle Noise: | 72.4 | 70.7 | 64.3 | 64.7 | 72.4 | 72.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 43 | 93 | 201 | 433 |
| CNEL: | 44 | 96 | 207 | 445 |

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

Scenario: HY 2040 With Project
Road Name: Avenida Barbosa
Road Segment: s/o Buena Vista St.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 19,175 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,917 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.17% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.79% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.04% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.85 | 3.26 | -1.20 | *-4.49* | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.06 | 3.33 | -1.20 | *-4.86* | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.48 | 3.32 | -1.20 | *-5.77* | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.4 | 67.2 | 64.3 | 62.5 | 69.9 | 70.2 |
| Medium Trucks: | 70.8 | 68.9 | 62.8 | 63.7 | 71.1 | 71.3 |
| Heavy Trucks: | 73.6 | 72.1 | 63.1 | 65.2 | 73.2 | 73.3 |
| Vehicle Noise: | 76.4 | 74.7 | 68.2 | 68.7 | 76.4 | 76.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 80 | 172 | 371 | 799 |
| CNEL: | 82 | 177 | 381 | 821 |

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

Scenario: HY 2040 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 11,505 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,150 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 89.44% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 6.72% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 3.85% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -1.20 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -12.45 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -14.87 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 67.4 | 65.2 | 62.2 | 60.5 | 67.8 | 68.1 |
| Medium Trucks: | 67.4 | 65.5 | 59.4 | 60.3 | 67.7 | 67.9 |
| Heavy Trucks: | 70.3 | 68.7 | 59.8 | 61.8 | 69.8 | 69.9 |
| Vehicle Noise: | 73.3 | 71.6 | 65.4 | 65.7 | 73.3 | 73.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 50 | 108 | 232 | 500 |
| CNEL: | 51 | 111 | 239 | 515 |

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

Scenario: HY 2040 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 5,895 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 589 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 93.04% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 4.42% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 2.53% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -3.93 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -17.16 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -19.58 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.6 | 62.5 | 59.5 | 57.7 | 65.1 | 65.4 |
| Medium Trucks: | 62.7 | 60.8 | 54.7 | 55.6 | 63.0 | 63.2 |
| Heavy Trucks: | 65.5 | 64.0 | 55.0 | 57.1 | 65.1 | 65.2 |
| Vehicle Noise: | 69.2 | 67.4 | 61.8 | 61.7 | 69.3 | 69.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 27 | 58 | 124 | 268 |
| CNEL: | 28 | 60 | 128 | 277 |

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

Scenario: HY 2040 With Project
Road Name: Rivergrade Rd.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 15,959 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,596 | vehicles |
| Vehicle Speed: | 50 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.15% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.81% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.05% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 70.20 | -0.91 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 81.00 | -10.82 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 85.38 | -13.24 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 71.4 | 69.2 | 66.2 | 64.5 | 71.8 | 72.1 |
| Medium Trucks: | 72.3 | 70.4 | 64.3 | 65.2 | 72.6 | 72.8 |
| Heavy Trucks: | 74.3 | 72.7 | 63.8 | 65.9 | 73.8 | 73.9 |
| Vehicle Noise: | 77.6 | 75.8 | 69.7 | 70.0 | 77.6 | 77.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 96 | 208 | 447 | 964 |
| CNEL: | 99 | 214 | 460 | 991 |

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

Scenario: HY 2040 With Project
Road Name: Stewart Av.
Road Segment: s/o Live Oak Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 7,844 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 784 | vehicles |
| Vehicle Speed: | 30 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.91% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.32% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.77% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 61.75 | -1.74 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 73.48 | -11.93 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 79.92 | -14.35 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 60.2 | 58.0 | 55.0 | 53.3 | 60.6 | 60.9 |
| Medium Trucks: | 61.8 | 59.9 | 53.8 | 54.7 | 62.1 | 62.2 |
| Heavy Trucks: | 65.8 | 64.2 | 55.3 | 57.4 | 65.3 | 65.5 |
| Vehicle Noise: | 68.0 | 66.3 | 59.5 | 60.2 | 67.9 | 68.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 29 | 63 | 135 | 290 |
| CNEL: | 30 | 64 | 138 | 298 |

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

Scenario: HY 2040 With Project
Road Name: Baldwin Park Bl.
Road Segment: s/o Live Oak Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 14,886 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,489 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.32% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.70% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.98% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 44.147 |
| Medium Trucks: | 43.947 |
| Heavy Trucks: | 43.966 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | -0.24 | 0.71 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -10.20 | 0.74 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.62 | 0.73 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 65.8 | 63.6 | 60.6 | 58.9 | 66.2 | 66.5 |
| Medium Trucks: | 67.0 | 65.2 | 59.1 | 59.9 | 67.4 | 67.5 |
| Heavy Trucks: | 69.9 | 68.4 | 59.4 | 61.5 | 69.5 | 69.6 |
| Vehicle Noise: | 72.7 | 70.9 | 64.5 | 65.0 | 72.7 | 72.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 75 | 162 | 350 | 753 |
| CNEL: | 77 | 167 | 359 | 774 |

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

Scenario: HY 2040 With Project
Road Name: Maine Av.
Road Segment: s/o Arrow Hwy.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 13,087 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,309 | vehicles |
| Vehicle Speed: | 35 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.41% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.64% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.95% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 39.862 |
| Medium Trucks: | 39.640 |
| Heavy Trucks: | 39.661 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 64.30 | -0.21 | 1.37 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 75.75 | -10.21 | 1.41 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 81.57 | -12.63 | 1.41 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 64.3 | 62.1 | 59.1 | 57.4 | 64.7 | 65.0 |
| Medium Trucks: | 65.7 | 63.9 | 57.8 | 58.6 | 66.1 | 66.2 |
| Heavy Trucks: | 69.1 | 67.6 | 58.6 | 60.7 | 68.7 | 68.8 |
| Vehicle Noise: | 71.7 | 69.9 | 63.3 | 63.9 | 71.6 | 71.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 51 | 110 | 237 | 510 |
| CNEL: | 52 | 113 | 243 | 524 |

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

Scenario: HY 2040 With Project
Road Name: Longden Av.
Road Segment: w/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 16,136 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 1,614 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.26% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.73% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.00% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 0.11 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -9.84 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -12.26 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 68.7 | 66.5 | 63.5 | 61.8 | 69.1 | 69.4 |
| Medium Trucks: | 70.0 | 68.1 | 62.0 | 62.9 | 70.3 | 70.5 |
| Heavy Trucks: | 72.9 | 71.3 | 62.4 | 64.5 | 72.4 | 72.5 |
| Vehicle Noise: | 75.7 | 73.9 | 67.5 | 68.0 | 75.6 | 75.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 71 | 153 | 330 | 710 |
| CNEL: | 73 | 157 | 339 | 729 |

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

Scenario: HY 2040 With Project
Road Name: Longden Av.
Road Segment: e/o Myrtle Av.

Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 21,096 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,110 | vehicles |
| Vehicle Speed: | 40 | mph |
| Near/Far Lane Distance: | 12 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 30.0 | feet |
| Centerline Dist. to Observer: | 30.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.59% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.53% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.88% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 29.816 |
| Medium Trucks: | 29.518 |
| Heavy Trucks: | 29.547 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 1.29 | 3.26 | -1.20 | -4.49 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -8.78 | 3.33 | -1.20 | -4.86 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -11.20 | 3.32 | -1.20 | -5.77 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.9 | 67.7 | 64.7 | 63.0 | 70.3 | 70.6 |
| Medium Trucks: | 71.1 | 69.2 | 63.1 | 64.0 | 71.4 | 71.5 |
| Heavy Trucks: | 73.9 | 72.4 | 63.4 | 65.5 | 73.5 | 73.6 |
| Vehicle Noise: | 76.7 | 75.0 | 68.6 | 69.1 | 76.7 | 76.9 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 84 | 181 | 389 | 839 |
| CNEL: | 86 | 186 | 400 | 862 |

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

Scenario: HY 2040 With Project
Road Name: Live Oak Av.
Road Segment: w/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 30,267 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 3,027 vehicles |
| Vehicle Speed: | 40 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 48.0 feet |
| Centerline Dist. to Observer: | 48.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.91% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.92% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.17% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 41.869 |
| Medium Trucks: | 41.657 |
| Heavy Trucks: | 41.678 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 66.51 | 2.82 | 1.05 | -1.20 | -4.64 | 0.000 | 0.000 |
| Medium Trucks: | 77.72 | -7.01 | 1.09 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 82.99 | -9.38 | 1.08 | -1.20 | -5.45 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 69.2 | 67.0 | 64.0 | 62.3 | 69.6 | 69.9 |
| Medium Trucks: | 70.6 | 68.7 | 62.6 | 63.5 | 70.9 | 71.1 |
| Heavy Trucks: | 73.5 | 72.0 | 63.0 | 65.1 | 73.1 | 73.2 |
| Vehicle Noise: | 76.2 | 74.5 | 68.0 | 68.5 | 76.2 | 76.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 124 | 268 | 577 | 1,243 |
| CNEL: | 128 | 275 | 593 | 1,277 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Peck Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 29,904 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 2,990 vehicles |
| Vehicle Speed: | 45 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.24% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.71% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.05% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.28 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.68 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.05 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.3 | 70.1 | 67.1 | 65.4 | 72.7 | 73.0 |
| Medium Trucks: | 73.3 | 71.5 | 65.4 | 66.2 | 73.7 | 73.8 |
| Heavy Trucks: | 75.8 | 74.2 | 65.3 | 67.4 | 75.3 | 75.5 |
| Vehicle Noise: | 78.8 | 77.1 | 70.8 | 71.2 | 78.8 | 79.0 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 155 | 333 | 718 | 1,547 |
| CNEL: | 159 | 343 | 738 | 1,591 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Longden Av.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 51,779 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 5,178 vehicles |
| Vehicle Speed: | 45 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.38% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.64% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.98% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.67 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -5.33 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.72 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.7 | 72.5 | 69.5 | 67.8 | 75.1 | 75.4 |
| Medium Trucks: | 75.7 | 73.8 | 67.7 | 68.6 | 76.0 | 76.2 |
| Heavy Trucks: | 78.1 | 76.6 | 67.6 | 69.7 | 77.7 | 77.8 |
| Vehicle Noise: | 81.2 | 79.4 | 73.1 | 73.5 | 81.2 | 81.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 222 | 478 | 1,030 | 2,219 |
| CNEL: | 228 | 492 | 1,059 | 2,282 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: e/o I-605 Fwy.
Project Name: The Park @ Live Oak
Job Number: 11112

**SITE SPECIFIC INPUT DATA**

**Highway Data**

| | |
|---|---|
| Average Daily Traffic (Adt): | 38,215 vehicles |
| Peak Hour Percentage: | 10% |
| Peak Hour Volume: | 3,821 vehicles |
| Vehicle Speed: | 45 mph |
| Near/Far Lane Distance: | 48 feet |

**Site Data**

| | |
|---|---|
| **Barrier Height:** | **0.0 feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 |
| Centerline Dist. to Barrier: | 40.0 feet |
| Centerline Dist. to Observer: | 40.0 feet |
| Barrier Distance to Observer: | 0.0 feet |
| Observer Height (Above Pad): | 5.0 feet |
| Pad Elevation: | 0.0 feet |
| Road Elevation: | 0.0 feet |
| Road Grade: | 0.0% |
| Left View: | -90.0 degrees |
| Right View: | 90.0 degrees |

**NOISE MODEL INPUTS**

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.31% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.07% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.62% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.40 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.95 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.37 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.4 | 71.2 | 68.2 | 66.5 | 73.8 | 74.1 |
| Medium Trucks: | 74.1 | 72.2 | 66.1 | 67.0 | 74.4 | 74.6 |
| Heavy Trucks: | 76.5 | 74.9 | 66.0 | 68.1 | 76.0 | 76.1 |
| Vehicle Noise: | 79.6 | 77.8 | 71.7 | 72.0 | 79.6 | 79.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 175 | 377 | 813 | 1,751 |
| CNEL: | 180 | 388 | 836 | 1,802 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 32,827 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,283 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 87.58% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 7.90% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.52% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.75 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.70 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.12 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.7 | 70.5 | 67.6 | 65.8 | 73.2 | 73.5 |
| Medium Trucks: | 73.3 | 71.4 | 65.3 | 66.2 | 73.6 | 73.8 |
| Heavy Trucks: | 75.7 | 74.2 | 65.2 | 67.3 | 75.3 | 75.4 |
| Vehicle Noise: | 78.9 | 77.1 | 71.0 | 71.3 | 78.9 | 79.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 157 | 338 | 727 | 1,567 |
| CNEL: | 161 | 347 | 748 | 1,612 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 28,764 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 2,876 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.34% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.69% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.98% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.11 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.86 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -10.28 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.1 | 69.9 | 66.9 | 65.2 | 72.5 | 72.9 |
| Medium Trucks: | 73.2 | 71.3 | 65.2 | 66.1 | 73.5 | 73.6 |
| Heavy Trucks: | 75.5 | 74.0 | 65.1 | 67.1 | 75.1 | 75.2 |
| Vehicle Noise: | 78.6 | 76.9 | 70.6 | 71.0 | 78.6 | 78.8 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 150 | 323 | 696 | 1,500 |
| CNEL: | 154 | 332 | 716 | 1,543 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: w/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 54,499 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 5,450 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.01% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.89% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.09% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 4.87 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -4.98 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -7.40 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 74.9 | 72.7 | 69.7 | 68.0 | 75.3 | 75.6 |
| Medium Trucks: | 76.0 | 74.2 | 68.1 | 68.9 | 76.4 | 76.5 |
| Heavy Trucks: | 78.4 | 76.9 | 67.9 | 70.0 | 78.0 | 78.1 |
| Vehicle Noise: | 81.5 | 79.7 | 73.4 | 73.8 | 81.5 | 81.6 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 232 | 501 | 1,078 | 2,323 |
| CNEL: | 239 | 515 | 1,109 | 2,389 |

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

Scenario: HY 2040 With Project
Road Name: Arrow Hwy.
Road Segment: e/o Maine Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 40,304 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 4,030 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 48 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 40.0 | feet |
| Centerline Dist. to Observer: | 40.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.91% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.94% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.15% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 32.388 |
| Medium Trucks: | 32.114 |
| Heavy Trucks: | 32.141 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.56 | 2.73 | -1.20 | -4.59 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.27 | 2.78 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -8.67 | 2.78 | -1.20 | -5.56 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.5 | 71.4 | 68.4 | 66.6 | 74.0 | 74.3 |
| Medium Trucks: | 74.8 | 72.9 | 66.8 | 67.7 | 75.1 | 75.2 |
| Heavy Trucks: | 77.2 | 75.6 | 66.7 | 68.8 | 76.7 | 76.8 |
| Vehicle Noise: | 80.2 | 78.4 | 72.1 | 72.5 | 80.2 | 80.4 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 191 | 411 | 886 | 1,908 |
| CNEL: | 196 | 423 | 910 | 1,961 |

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

Scenario: HY 2040 With Project
Road Name: Live Oak Av.
Road Segment: w/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 35,749 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,575 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.39% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.63% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 4.98% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.06 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.94 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.33 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.5 | 71.3 | 68.3 | 66.6 | 73.9 | 74.2 |
| Medium Trucks: | 74.5 | 72.6 | 66.5 | 67.4 | 74.8 | 75.0 |
| Heavy Trucks: | 76.9 | 75.4 | 66.4 | 68.5 | 76.5 | 76.6 |
| Vehicle Noise: | 80.0 | 78.2 | 71.9 | 72.3 | 80.0 | 80.1 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 231 | 497 | 1,071 | 2,308 |
| CNEL: | 237 | 511 | 1,102 | 2,374 |

Wednesday, May 02, 2018

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

Scenario: HY 2040 With Project
Road Name: Live Oak Av.
Road Segment: e/o Rivergrade Rd.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 37,931 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,793 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 86.14% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.80% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.07% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.30 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.61 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.00 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.7 | 71.5 | 68.5 | 66.8 | 74.1 | 74.5 |
| Medium Trucks: | 74.8 | 73.0 | 66.9 | 67.7 | 75.2 | 75.3 |
| Heavy Trucks: | 77.2 | 75.7 | 66.8 | 68.8 | 76.8 | 76.9 |
| Vehicle Noise: | 80.3 | 78.5 | 72.2 | 72.6 | 80.3 | 80.5 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 242 | 522 | 1,124 | 2,422 |
| CNEL: | 249 | 537 | 1,156 | 2,490 |

Wednesday, May 02, 2018

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

Scenario: HY 2040 With Project
Road Name: Live Oak Av.
Road Segment: e/o Stewart Av.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 35,737 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,574 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.89% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.95% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.16% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 3.03 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -6.79 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.18 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 73.4 | 71.2 | 68.3 | 66.5 | 73.9 | 74.2 |
| Medium Trucks: | 74.7 | 72.8 | 66.7 | 67.6 | 75.0 | 75.1 |
| Heavy Trucks: | 77.1 | 75.5 | 66.6 | 68.7 | 76.6 | 76.7 |
| Vehicle Noise: | 80.1 | 78.3 | 72.0 | 72.4 | 80.1 | 80.3 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 235 | 506 | 1,090 | 2,348 |
| CNEL: | 241 | 520 | 1,120 | 2,414 |

Wednesday, May 02, 2018

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

Scenario: HY 2040 With Project
Road Name: Live Oak Av.
Road Segment: w/o Arrow Hwy.
Project Name: The Park @ Live Oak
Job Number: 11112

### SITE SPECIFIC INPUT DATA

**Highway Data**

| | | |
|---|---|---|
| Average Daily Traffic (Adt): | 31,418 | vehicles |
| Peak Hour Percentage: | 10% | |
| Peak Hour Volume: | 3,142 | vehicles |
| Vehicle Speed: | 45 | mph |
| Near/Far Lane Distance: | 80 | feet |

**Site Data**

| | | |
|---|---|---|
| **Barrier Height:** | **0.0** | **feet** |
| Barrier Type (0-Wall, 1-Berm): | 0.0 | |
| Centerline Dist. to Barrier: | 50.0 | feet |
| Centerline Dist. to Observer: | 50.0 | feet |
| Barrier Distance to Observer: | 0.0 | feet |
| Observer Height (Above Pad): | 5.0 | feet |
| Pad Elevation: | 0.0 | feet |
| Road Elevation: | 0.0 | feet |
| Road Grade: | 0.0% | |
| Left View: | -90.0 | degrees |
| Right View: | 90.0 | degrees |

### NOISE MODEL INPUTS

**Site Conditions (Hard = 10, Soft = 15)**

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

**Vehicle Mix**

| VehicleType | Day | Evening | Night | Daily |
|---|---|---|---|---|
| Autos: | 72.4% | 9.2% | 18.4% | 85.92% |
| Medium Trucks: | 77.7% | 4.8% | 17.5% | 8.93% |
| Heavy Trucks: | 84.3% | 2.7% | 13.0% | 5.15% |

**Noise Source Elevations (in feet)**

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

**Lane Equivalent Distance (in feet)**

| | |
|---|---|
| Autos: | 30.414 |
| Medium Trucks: | 30.122 |
| Heavy Trucks: | 30.150 |

**FHWA Noise Model Calculations**

| VehicleType | REMEL | Traffic Flow | Distance | Finite Road | Fresnel | Barrier Atten | Berm Atten |
|---|---|---|---|---|---|---|---|
| Autos: | 68.46 | 2.48 | 3.14 | -1.20 | -4.65 | 0.000 | 0.000 |
| Medium Trucks: | 79.45 | -7.36 | 3.20 | -1.20 | -4.87 | 0.000 | 0.000 |
| Heavy Trucks: | 84.25 | -9.75 | 3.19 | -1.20 | -5.43 | 0.000 | 0.000 |

**Unmitigated Noise Levels (without Topo and barrier attenuation)**

| VehicleType | Leq Peak Hour | Leq Day | Leq Evening | Leq Night | Ldn | CNEL |
|---|---|---|---|---|---|---|
| Autos: | 72.9 | 70.7 | 67.7 | 66.0 | 73.3 | 73.6 |
| Medium Trucks: | 74.1 | 72.2 | 66.1 | 67.0 | 74.4 | 74.6 |
| Heavy Trucks: | 76.5 | 75.0 | 66.0 | 68.1 | 76.1 | 76.2 |
| Vehicle Noise: | 79.5 | 77.8 | 71.5 | 71.9 | 79.5 | 79.7 |

**Centerline Distance to Noise Contour (in feet)**

| | 70 dBA | 65 dBA | 60 dBA | 55 dBA |
|---|---|---|---|---|
| Ldn: | 215 | 464 | 999 | 2,152 |
| CNEL: | 221 | 477 | 1,027 | 2,213 |

Wednesday, May 02, 2018

# APPENDIX 9.1:

# OPERATIONAL NOISE LEVEL CALCULATIONS

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**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R1**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,983.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,983.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,983.0 | -44.4 | -44.4 | -44.4 | -44.4 | -44.4 | -44.4 |
| Shielding (Barrier Attenuation) | 4,983.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 25.7 | -44.4 | -44.4 | -44.4 | -44.4 | -44.4 |
| **60 Minute Hourly Adjustment** | | **25.7** | **-44.4** | **-44.4** | **-44.4** | **-44.4** | **-44.4** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,375.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,375.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,375.0 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 |
| Shielding (Barrier Attenuation) | 4,375.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 18.4 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 |
| **39 Minute Hourly Adjustment** | | **16.5** | **-60.7** | **-60.7** | **-60.7** | **-60.7** | **-60.7** |

## STATIONARY SOURCE NOISE PREDICTION MODEL

6/20/2018

***Observer Location:*** **R1**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

### NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,443.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,443.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

### NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,443.0 | -49.4 | -49.4 | -49.4 | -49.4 | -49.4 | -49.4 |
| Shielding (Barrier Attenuation) | 4,443.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 12.6 | -49.4 | -49.4 | -49.4 | -49.4 | -49.4 |
| **60 Minute Hourly Adjustment** | | **12.6** | **-49.4** | **-49.4** | **-49.4** | **-49.4** | **-49.4** |

## STATIONARY SOURCE NOISE PREDICTION MODEL

6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

### NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,336.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,336.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

### NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,336.0 | -39.6 | -39.6 | -39.6 | -39.6 | -39.6 | -39.6 |
| Shielding (Barrier Attenuation) | 4,336.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 12.6 | -39.6 | -39.6 | -39.6 | -39.6 | -39.6 |
| **60 Minute Hourly Adjustment** | | **12.6** | **-39.6** | **-39.6** | **-39.6** | **-39.6** | **-39.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R1**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,336.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,336.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,336.0 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 |
| Shielding (Barrier Attenuation) | 4,336.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 9.4 | -58.8 | -58.8 | -58.8 | -58.8 | -58.8 |
| **60 Minute Hourly Adjustment** | | **9.4** | **-58.8** | **-58.8** | **-58.8** | **-58.8** | **-58.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R2**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 2,264.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 2,264.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 2,264.0 | -37.6 | -37.6 | -37.6 | -37.6 | -37.6 | -37.6 |
| Shielding (Barrier Attenuation) | 2,264.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 32.5 | -37.6 | -37.6 | -37.6 | -37.6 | -37.6 |
| **60 Minute Hourly Adjustment** | | **32.5** | **-37.6** | **-37.6** | **-37.6** | **-37.6** | **-37.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 1,950.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 1,950.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 1,950.0 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 |
| Shielding (Barrier Attenuation) | 1,950.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 25.4 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 |
| **39 Minute Hourly Adjustment** | | **23.5** | **-53.7** | **-53.7** | **-53.7** | **-53.7** | **-53.7** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R2**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 2,018.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 2,018.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 2,018.0 | -42.6 | -42.6 | -42.6 | -42.6 | -42.6 | -42.6 |
| Shielding (Barrier Attenuation) | 2,018.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 19.4 | -42.6 | -42.6 | -42.6 | -42.6 | -42.6 |
| **60 Minute Hourly Adjustment** | | **19.4** | **-42.6** | **-42.6** | **-42.6** | **-42.6** | **-42.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 1,945.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 1,945.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 1,945.0 | -34.3 | -34.3 | -34.3 | -34.3 | -34.3 | -34.3 |
| Shielding (Barrier Attenuation) | 1,945.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 17.9 | -34.3 | -34.3 | -34.3 | -34.3 | -34.3 |
| **60 Minute Hourly Adjustment** | | **17.9** | **-34.3** | **-34.3** | **-34.3** | **-34.3** | **-34.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R2**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 1,945.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 1,945.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 1,945.0 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 |
| Shielding (Barrier Attenuation) | 1,945.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 16.4 | -51.8 | -51.8 | -51.8 | -51.8 | -51.8 |
| **60 Minute Hourly Adjustment** | | **16.4** | **-51.8** | **-51.8** | **-51.8** | **-51.8** | **-51.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R3**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,009.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,009.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,009.0 | -44.5 | -44.5 | -44.5 | -44.5 | -44.5 | -44.5 |
| Shielding (Barrier Attenuation) | 5,009.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 25.6 | -44.5 | -44.5 | -44.5 | -44.5 | -44.5 |
| **60 Minute Hourly Adjustment** | | **25.6** | **-44.5** | **-44.5** | **-44.5** | **-44.5** | **-44.5** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,811.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,811.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,811.0 | -59.7 | -59.7 | -59.7 | -59.7 | -59.7 | -59.7 |
| Shielding (Barrier Attenuation) | 4,811.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 17.5 | -59.7 | -59.7 | -59.7 | -59.7 | -59.7 |
| **39 Minute Hourly Adjustment** | | **15.6** | **-61.6** | **-61.6** | **-61.6** | **-61.6** | **-61.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R3**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,806.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,806.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,806.0 | -50.1 | -50.1 | -50.1 | -50.1 | -50.1 | -50.1 |
| Shielding (Barrier Attenuation) | 4,806.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 11.9 | -50.1 | -50.1 | -50.1 | -50.1 | -50.1 |
| **60 Minute Hourly Adjustment** | | **11.9** | **-50.1** | **-50.1** | **-50.1** | **-50.1** | **-50.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,616.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,616.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,616.0 | -40.0 | -40.0 | -40.0 | -40.0 | -40.0 | -40.0 |
| Shielding (Barrier Attenuation) | 4,616.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 12.2 | -40.0 | -40.0 | -40.0 | -40.0 | -40.0 |
| **60 Minute Hourly Adjustment** | | **12.2** | **-40.0** | **-40.0** | **-40.0** | **-40.0** | **-40.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R3**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,616.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,616.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,616.0 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 |
| Shielding (Barrier Attenuation) | 4,616.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 8.9 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 |
| **60 Minute Hourly Adjustment** | | **8.9** | **-59.3** | **-59.3** | **-59.3** | **-59.3** | **-59.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R4**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 6,684.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 6,684.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 6,684.0 | -47.0 | -47.0 | -47.0 | -47.0 | -47.0 | -47.0 |
| Shielding (Barrier Attenuation) | 6,684.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 23.1 | -47.0 | -47.0 | -47.0 | -47.0 | -47.0 |
| **60 Minute Hourly Adjustment** | | **23.1** | **-47.0** | **-47.0** | **-47.0** | **-47.0** | **-47.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 6,449.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 6,449.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 6,449.0 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 |
| Shielding (Barrier Attenuation) | 6,449.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 15.0 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 |
| **39 Minute Hourly Adjustment** | | **13.1** | **-64.1** | **-64.1** | **-64.1** | **-64.1** | **-64.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R4**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 6,525.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 6,525.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 6,525.0 | -52.8 | -52.8 | -52.8 | -52.8 | -52.8 | -52.8 |
| Shielding (Barrier Attenuation) | 6,525.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 9.2 | -52.8 | -52.8 | -52.8 | -52.8 | -52.8 |
| **60 Minute Hourly Adjustment** | | **9.2** | **-52.8** | **-52.8** | **-52.8** | **-52.8** | **-52.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 6,434.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 6,434.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 6,434.0 | -42.1 | -42.1 | -42.1 | -42.1 | -42.1 | -42.1 |
| Shielding (Barrier Attenuation) | 6,434.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 10.1 | -42.1 | -42.1 | -42.1 | -42.1 | -42.1 |
| **60 Minute Hourly Adjustment** | | **10.1** | **-42.1** | **-42.1** | **-42.1** | **-42.1** | **-42.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R4**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 6,434.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 6,434.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 6,434.0 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 |
| Shielding (Barrier Attenuation) | 6,434.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 6.0 | -62.2 | -62.2 | -62.2 | -62.2 | -62.2 |
| **60 Minute Hourly Adjustment** | | **6.0** | **-62.2** | **-62.2** | **-62.2** | **-62.2** | **-62.2** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R5**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,425.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,425.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,425.0 | -43.4 | -43.4 | -43.4 | -43.4 | -43.4 | -43.4 |
| Shielding (Barrier Attenuation) | 4,425.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 26.7 | -43.4 | -43.4 | -43.4 | -43.4 | -43.4 |
| **60 Minute Hourly Adjustment** | | **26.7** | **-43.4** | **-43.4** | **-43.4** | **-43.4** | **-43.4** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,609.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,609.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,609.0 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 |
| Shielding (Barrier Attenuation) | 4,609.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 17.9 | -59.3 | -59.3 | -59.3 | -59.3 | -59.3 |
| **39 Minute Hourly Adjustment** | | **16.0** | **-61.2** | **-61.2** | **-61.2** | **-61.2** | **-61.2** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R5**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,598.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,598.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,598.0 | -49.7 | -49.7 | -49.7 | -49.7 | -49.7 | -49.7 |
| Shielding (Barrier Attenuation) | 4,598.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 12.3 | -49.7 | -49.7 | -49.7 | -49.7 | -49.7 |
| **60 Minute Hourly Adjustment** | | **12.3** | **-49.7** | **-49.7** | **-49.7** | **-49.7** | **-49.7** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

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

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,537.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,537.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,537.0 | -39.9 | -39.9 | -39.9 | -39.9 | -39.9 | -39.9 |
| Shielding (Barrier Attenuation) | 4,537.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 12.3 | -39.9 | -39.9 | -39.9 | -39.9 | -39.9 |
| **60 Minute Hourly Adjustment** | | **12.3** | **-39.9** | **-39.9** | **-39.9** | **-39.9** | **-39.9** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R5**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,537.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,537.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,537.0 | -59.2 | -59.2 | -59.2 | -59.2 | -59.2 | -59.2 |
| Shielding (Barrier Attenuation) | 4,537.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 9.0 | -59.2 | -59.2 | -59.2 | -59.2 | -59.2 |
| **60 Minute Hourly Adjustment** | | **9.0** | **-59.2** | **-59.2** | **-59.2** | **-59.2** | **-59.2** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R6**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 3,758.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 3,758.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 3,758.0 | -42.0 | -42.0 | -42.0 | -42.0 | -42.0 | -42.0 |
| Shielding (Barrier Attenuation) | 3,758.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 28.1 | -42.0 | -42.0 | -42.0 | -42.0 | -42.0 |
| **60 Minute Hourly Adjustment** | | **28.1** | **-42.0** | **-42.0** | **-42.0** | **-42.0** | **-42.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R6**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 3,789.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 3,789.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 3,789.0 | -57.6 | -57.6 | -57.6 | -57.6 | -57.6 | -57.6 |
| Shielding (Barrier Attenuation) | 3,789.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 19.6 | -57.6 | -57.6 | -57.6 | -57.6 | -57.6 |
| **39 Minute Hourly Adjustment** | | **17.7** | **-59.5** | **-59.5** | **-59.5** | **-59.5** | **-59.5** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R6**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,858.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,858.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,858.0 | -50.2 | -50.2 | -50.2 | -50.2 | -50.2 | -50.2 |
| Shielding (Barrier Attenuation) | 4,858.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 11.8 | -50.2 | -50.2 | -50.2 | -50.2 | -50.2 |
| **60 Minute Hourly Adjustment** | | **11.8** | **-50.2** | **-50.2** | **-50.2** | **-50.2** | **-50.2** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R6**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 3,628.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 3,628.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 3,628.0 | -38.4 | -38.4 | -38.4 | -38.4 | -38.4 | -38.4 |
| Shielding (Barrier Attenuation) | 3,628.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 13.8 | -38.4 | -38.4 | -38.4 | -38.4 | -38.4 |
| **60 Minute Hourly Adjustment** | | **13.8** | **-38.4** | **-38.4** | **-38.4** | **-38.4** | **-38.4** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R6**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 4,758.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 4,758.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 4,758.0 | -59.6 | -59.6 | -59.6 | -59.6 | -59.6 | -59.6 |
| Shielding (Barrier Attenuation) | 4,758.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 8.6 | -59.6 | -59.6 | -59.6 | -59.6 | -59.6 |
| **60 Minute Hourly Adjustment** | | **8.6** | **-59.6** | **-59.6** | **-59.6** | **-59.6** | **-59.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R7**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,721.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,721.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,721.0 | -45.6 | -45.6 | -45.6 | -45.6 | -45.6 | -45.6 |
| Shielding (Barrier Attenuation) | 5,721.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 24.5 | -45.6 | -45.6 | -45.6 | -45.6 | -45.6 |
| **60 Minute Hourly Adjustment** | | **24.5** | **-45.6** | **-45.6** | **-45.6** | **-45.6** | **-45.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R7**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,688.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,688.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,688.0 | -61.1 | -61.1 | -61.1 | -61.1 | -61.1 | -61.1 |
| Shielding (Barrier Attenuation) | 5,688.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 16.1 | -61.1 | -61.1 | -61.1 | -61.1 | -61.1 |
| **39 Minute Hourly Adjustment** | | **14.2** | **-63.0** | **-63.0** | **-63.0** | **-63.0** | **-63.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R7**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,671.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,671.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,671.0 | -51.6 | -51.6 | -51.6 | -51.6 | -51.6 | -51.6 |
| Shielding (Barrier Attenuation) | 5,671.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 10.4 | -51.6 | -51.6 | -51.6 | -51.6 | -51.6 |
| **60 Minute Hourly Adjustment** | | **10.4** | **-51.6** | **-51.6** | **-51.6** | **-51.6** | **-51.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R7**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,637.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,637.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,637.0 | -41.3 | -41.3 | -41.3 | -41.3 | -41.3 | -41.3 |
| Shielding (Barrier Attenuation) | 5,637.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 10.9 | -41.3 | -41.3 | -41.3 | -41.3 | -41.3 |
| **60 Minute Hourly Adjustment** | | **10.9** | **-41.3** | **-41.3** | **-41.3** | **-41.3** | **-41.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R7**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 5,637.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 5,637.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 5,637.0 | -61.0 | -61.0 | -61.0 | -61.0 | -61.0 | -61.0 |
| Shielding (Barrier Attenuation) | 5,637.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 7.2 | -61.0 | -61.0 | -61.0 | -61.0 | -61.0 |
| **60 Minute Hourly Adjustment** | | **7.2** | **-61.0** | **-61.0** | **-61.0** | **-61.0** | **-61.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R8**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 386.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 386.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 386.0 | -22.2 | -22.2 | -22.2 | -22.2 | -22.2 | -22.2 |
| Shielding (Barrier Attenuation) | 386.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 47.9 | -22.2 | -22.2 | -22.2 | -22.2 | -22.2 |
| **60 Minute Hourly Adjustment** | | **47.9** | **-22.2** | **-22.2** | **-22.2** | **-22.2** | **-22.2** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R8**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 313.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 313.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 313.0 | -35.9 | -35.9 | -35.9 | -35.9 | -35.9 | -35.9 |
| Shielding (Barrier Attenuation) | 313.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 41.3 | -35.9 | -35.9 | -35.9 | -35.9 | -35.9 |
| **39 Minute Hourly Adjustment** | | **39.4** | **-37.8** | **-37.8** | **-37.8** | **-37.8** | **-37.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R8**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 205.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 205.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 205.0 | -22.7 | -22.7 | -22.7 | -22.7 | -22.7 | -22.7 |
| Shielding (Barrier Attenuation) | 205.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 39.3 | -22.7 | -22.7 | -22.7 | -22.7 | -22.7 |
| **60 Minute Hourly Adjustment** | | **39.3** | **-22.7** | **-22.7** | **-22.7** | **-22.7** | **-22.7** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R8**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 176.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 176.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 176.0 | -18.7 | -18.7 | -18.7 | -18.7 | -18.7 | -18.7 |
| Shielding (Barrier Attenuation) | 176.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 33.5 | -18.7 | -18.7 | -18.7 | -18.7 | -18.7 |
| **60 Minute Hourly Adjustment** | | **33.5** | **-18.7** | **-18.7** | **-18.7** | **-18.7** | **-18.7** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R8**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 176.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 176.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 176.0 | -30.9 | -30.9 | -30.9 | -30.9 | -30.9 | -30.9 |
| Shielding (Barrier Attenuation) | 176.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 37.3 | -30.9 | -30.9 | -30.9 | -30.9 | -30.9 |
| **60 Minute Hourly Adjustment** | | **37.3** | **-30.9** | **-30.9** | **-30.9** | **-30.9** | **-30.9** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R9**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 493.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 493.0 | feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 493.0 | -24.3 | -24.3 | -24.3 | -24.3 | -24.3 | -24.3 |
| Shielding (Barrier Attenuation) | 493.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 45.8 | -24.3 | -24.3 | -24.3 | -24.3 | -24.3 |
| **60 Minute Hourly Adjustment** | | **45.8** | **-24.3** | **-24.3** | **-24.3** | **-24.3** | **-24.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R9**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 397.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 397.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 397.0 | -38.0 | -38.0 | -38.0 | -38.0 | -38.0 | -38.0 |
| Shielding (Barrier Attenuation) | 397.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 39.2 | -38.0 | -38.0 | -38.0 | -38.0 | -38.0 |
| **39 Minute Hourly Adjustment** | | **37.3** | **-39.9** | **-39.9** | **-39.9** | **-39.9** | **-39.9** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R9**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 383.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 383.0 feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 383.0 | -28.1 | -28.1 | -28.1 | -28.1 | -28.1 | -28.1 |
| Shielding (Barrier Attenuation) | 383.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 33.9 | -28.1 | -28.1 | -28.1 | -28.1 | -28.1 |
| **60 Minute Hourly Adjustment** | | **33.9** | **-28.1** | **-28.1** | **-28.1** | **-28.1** | **-28.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R9**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 346.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 346.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 346.0 | -23.1 | -23.1 | -23.1 | -23.1 | -23.1 | -23.1 |
| Shielding (Barrier Attenuation) | 346.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 29.1 | -23.1 | -23.1 | -23.1 | -23.1 | -23.1 |
| **60 Minute Hourly Adjustment** | | **29.1** | **-23.1** | **-23.1** | **-23.1** | **-23.1** | **-23.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R9**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | | |
|---|---|---|---|---|---|
| *Noise Distance to Observer* | 346.0 | feet | ***Barrier Height:*** | **0.0** | **feet** |
| *Noise Distance to Barrier:* | 346.0 | feet | *Noise Source Height:* | 5.0 | feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 | feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 | |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 | |
| *Barrier Elevation:* | 0.0 | feet | | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 346.0 | -36.8 | -36.8 | -36.8 | -36.8 | -36.8 | -36.8 |
| Shielding (Barrier Attenuation) | 346.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 31.4 | -36.8 | -36.8 | -36.8 | -36.8 | -36.8 |
| **60 Minute Hourly Adjustment** | | **31.4** | **-36.8** | **-36.8** | **-36.8** | **-36.8** | **-36.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R10**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | | |
|---|---|---|---|---|---|
| *Noise Distance to Observer* | 599.0 | feet | ***Barrier Height:*** | **0.0** | **feet** |
| *Noise Distance to Barrier:* | 599.0 | feet | *Noise Source Height:* | 8.0 | feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 | feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 | |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 | |
| *Barrier Elevation:* | 0.0 | feet | | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 599.0 | -26.0 | -26.0 | -26.0 | -26.0 | -26.0 | -26.0 |
| Shielding (Barrier Attenuation) | 599.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 44.1 | -26.0 | -26.0 | -26.0 | -26.0 | -26.0 |
| **60 Minute Hourly Adjustment** | | **44.1** | **-26.0** | **-26.0** | **-26.0** | **-26.0** | **-26.0** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R10**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 363.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 363.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 363.0 | -37.2 | -37.2 | -37.2 | -37.2 | -37.2 | -37.2 |
| Shielding (Barrier Attenuation) | 363.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 40.0 | -37.2 | -37.2 | -37.2 | -37.2 | -37.2 |
| **39 Minute Hourly Adjustment** | | **38.1** | **-39.1** | **-39.1** | **-39.1** | **-39.1** | **-39.1** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R10**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 657.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 657.0 feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 657.0 | -32.8 | -32.8 | -32.8 | -32.8 | -32.8 | -32.8 |
| Shielding (Barrier Attenuation) | 657.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 29.2 | -32.8 | -32.8 | -32.8 | -32.8 | -32.8 |
| **60 Minute Hourly Adjustment** | | **29.2** | **-32.8** | **-32.8** | **-32.8** | **-32.8** | **-32.8** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R10**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 305.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 305.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 305.0 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 |
| Shielding (Barrier Attenuation) | 305.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 29.9 | -22.3 | -22.3 | -22.3 | -22.3 | -22.3 |
| **60 Minute Hourly Adjustment** | | **29.9** | **-22.3** | **-22.3** | **-22.3** | **-22.3** | **-22.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R10**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 599.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 599.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 599.0 | -41.6 | -41.6 | -41.6 | -41.6 | -41.6 | -41.6 |
| Shielding (Barrier Attenuation) | 599.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 26.6 | -41.6 | -41.6 | -41.6 | -41.6 | -41.6 |
| **60 Minute Hourly Adjustment** | | **26.6** | **-41.6** | **-41.6** | **-41.6** | **-41.6** | **-41.6** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R11**
*Source:* Truck Idle/Reefer Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 876.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 876.0 feet | *Noise Source Height:* | 8.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 30.0 | 70.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 876.0 | -29.3 | -29.3 | -29.3 | -29.3 | -29.3 | -29.3 |
| Shielding (Barrier Attenuation) | 876.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 40.8 | -29.3 | -29.3 | -29.3 | -29.3 | -29.3 |
| **60 Minute Hourly Adjustment** | | **40.8** | **-29.3** | **-29.3** | **-29.3** | **-29.3** | **-29.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R11**
*Source:* Roof-Top Air Conditioning Unit
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | |
|---|---|---|---|
| *Noise Distance to Observer* | 314.0 feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 314.0 feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 20.0 feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 77.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 314.0 | -36.0 | -36.0 | -36.0 | -36.0 | -36.0 | -36.0 |
| Shielding (Barrier Attenuation) | 314.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 41.2 | -36.0 | -36.0 | -36.0 | -36.0 | -36.0 |
| **39 Minute Hourly Adjustment** | | **39.3** | **-37.9** | **-37.9** | **-37.9** | **-37.9** | **-37.9** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R11**
*Source:* Drive-Through Speakerphone
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 348.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 348.0 | feet | *Noise Source Height:* | 3.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 15.0 | 62.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 348.0 | -27.3 | -27.3 | -27.3 | -27.3 | -27.3 | -27.3 |
| Shielding (Barrier Attenuation) | 348.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 34.7 | -27.3 | -27.3 | -27.3 | -27.3 | -27.3 |
| **60 Minute Hourly Adjustment** | | **34.7** | **-27.3** | **-27.3** | **-27.3** | **-27.3** | **-27.3** |

**STATIONARY SOURCE NOISE PREDICTION MODEL** 6/20/2018

***Observer Location:*** **R11**
*Source:* Parking Lot Vehicle Movements
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 272.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 272.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 15.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 10.0 | 52.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 272.0 | -21.5 | -21.5 | -21.5 | -21.5 | -21.5 | -21.5 |
| Shielding (Barrier Attenuation) | 272.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 30.7 | -21.5 | -21.5 | -21.5 | -21.5 | -21.5 |
| **60 Minute Hourly Adjustment** | | **30.7** | **-21.5** | **-21.5** | **-21.5** | **-21.5** | **-21.5** |

## STATIONARY SOURCE NOISE PREDICTION MODEL

6/20/2018

***Observer Location:*** **R11**
*Source:* Gas Station Activity
*Condition:* Operational

*Project Name:* The Park
*Job Number:* 11112
*Analyst:* A. Wolfe

### NOISE MODEL INPUTS

| | | | | |
|---|---|---|---|---|
| *Noise Distance to Observer* | 272.0 | feet | ***Barrier Height:*** | **0.0 feet** |
| *Noise Distance to Barrier:* | 272.0 | feet | *Noise Source Height:* | 5.0 feet |
| *Barrier Distance to Observer:* | 0.0 | feet | *Observer Height:* | 5.0 feet |
| *Observer Elevation:* | 0.0 | feet | *Barrier Type (0-Wall, 1-Berm):* | 0 |
| *Noise Source Elevation:* | 0.0 | feet | *Drop Off Coefficient:* | 20.0 |
| *Barrier Elevation:* | 0.0 | feet | | |

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

### NOISE MODEL PROJECTIONS

| *Noise Level* | *Distance (feet)* | *Leq* | *L50* | *L25* | *L8* | *L2* | *Lmax* |
|---|---|---|---|---|---|---|---|
| Reference (Sample) | 5.0 | 68.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Distance Attenuation | 272.0 | -34.7 | -34.7 | -34.7 | -34.7 | -34.7 | -34.7 |
| Shielding (Barrier Attenuation) | 272.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Raw (Distance + Barrier) | | 33.5 | -34.7 | -34.7 | -34.7 | -34.7 | -34.7 |
| **60 Minute Hourly Adjustment** | | **33.5** | **-34.7** | **-34.7** | **-34.7** | **-34.7** | **-34.7** |