



Seaton Commerce Center

NOISE IMPACT ANALYSIS

COUNTY OF RIVERSIDE

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
I-215	Interstate 215
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
MARB/IPA	March Air Reserve Base / Inland Port Airport
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Seaton Commerce Center
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 potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Seaton Commerce Center development (“Project”). The Project site is located on the southeast corner of Seaton Avenue and Perry Street, in unincorporated County of Riverside. The Project is proposed to consist of up to 162,423 square feet of high-cube transload / short-term storage warehouse (without cold storage) use (80 percent of the total square footage) and 40,606 square feet of general light industrial use (20 percent of the total square footage) for a total of 203,029 square feet within a single building. The Project is anticipated to be constructed in a single phase by the Year 2020. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. This study has been prepared to satisfy applicable County of Riverside standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on six study-area roadway segments 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 *Seaton Commerce Center 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 (2018), Existing plus Ambient Growth (EA) (2020), and EA plus Cumulative (EAC) (2020) conditions.

The analysis shows that the unmitigated Project-related traffic noise level increases under all with Project traffic scenarios are considered *less than significant* impacts at land uses adjacent to the study area roadway segments.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected operational noise sources of the Seaton Commerce Center site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The typical activities associated with the proposed Seaton Commerce Center are anticipated to include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. The operational noise analysis shows that the Project-related stationary-source noise levels at all receiver locations will satisfy the County of Riverside 65 dBA L_{eq} daytime and 45 dBA L_{eq} nighttime exterior noise level standards.

Further, this analysis demonstrates that the unmitigated Project operational noise levels will not contribute a long-term operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, are considered *less than significant*.

OPERATIONAL VIBRATION ANALYSIS

The operation of the Project site will include heavy trucks moving on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. According to the FTA *Transit Noise Impact and Vibration Assessment*, (3) trucks rarely create vibration that exceeds 70 VdB or 0.003 in/sec RMS (4) (unless there are bumps due to frequent potholes in the road). Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the 0.01 in/sec RMS vibration threshold of the County of Riverside, and therefore, will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site. Using sample reference noise levels to represent the planned construction activities of the Seaton Commerce Center site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. Since the County of Riverside General Plan and Municipal Codes do not identify specific construction noise level thresholds, a threshold is identified based on the National Institute for Occupational Safety and Health (NIOSH) limits for construction noise. The Project-related short-term construction noise levels are expected to range from 44.0 to 74.5 dBA L_{eq} and will satisfy the 85 dBA L_{eq} NIOSH thresholds at all receiver locations. Therefore, based on the results of this analysis, all nearby sensitive receiver locations will experience *less than significant* impacts due to Project construction noise levels.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. This analysis shows the highest construction vibration levels are expected to approach 0.009 in/sec RMS, which is below the vibration standard of 0.01 in/sec RMS at all receiver locations in the County of Riverside. Therefore, the Project-related vibration impacts are considered *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 approaching 0.013 in/sec PPV will remain below the FTA vibration levels for building damage at the residential homes near the Project site. Moreover, 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 Seaton Commerce Center Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

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1 INTRODUCTION

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

1.1 SITE LOCATION

The proposed Seaton Commerce Center site is located on the southeast corner of Seaton Avenue and Perry Street, in unincorporated County of Riverside, as shown on Exhibit 1-A.

The Project site is currently vacant. Existing land uses near the site include noise-sensitive residential homes west of the Project site; an industrial warehouse currently under construction located east of the Project site; and existing industrial uses northwest, west, and south of the Project site. Light Industrial-designated land use is located north and immediately east of the Project site. Interstate 215 (I-215) is located approximately 1,500 feet northeast of the Project site, and the March Air Reserve Base/Inland Port Airport (MARB/IPA) is located roughly 1.2 miles northeast of the Project site.

1.2 PROJECT DESCRIPTION

The Site Plan shown on Exhibit 1-B identifies 203,029 square feet of building area. This is slightly less than building area of 203,584 square feet that what was assumed in the *Seaton Commerce Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) While the off-site traffic noise analysis is based on the full building area of 203,584 square feet consistent with the Traffic Impact Analysis, the Site Plan shown on Exhibit 1-B was used to describe the Project operational and construction noise level impacts. The Project is anticipated to be constructed in a single phase by the Year 2020.

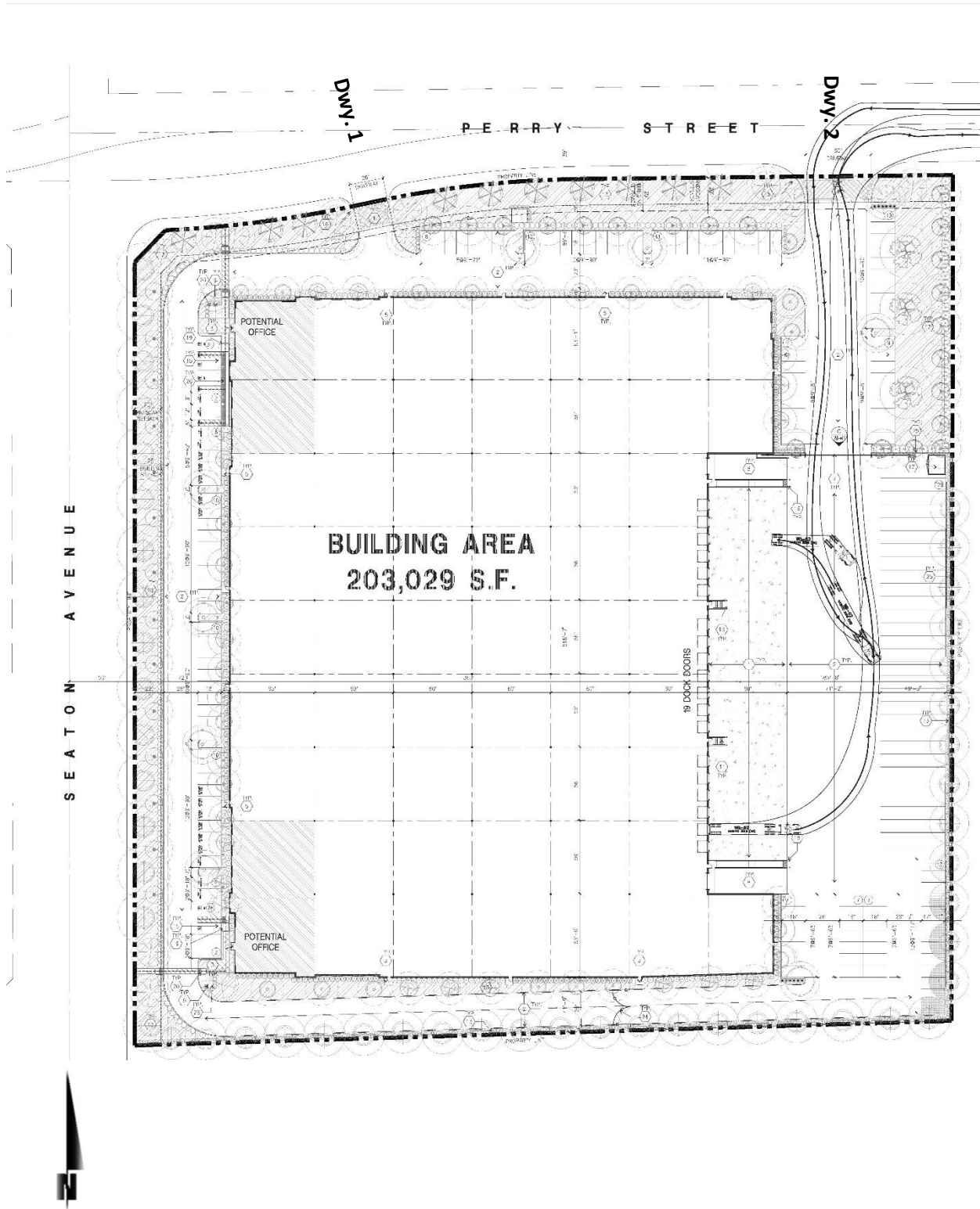
At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site. To present a conservative approach, this report assumes the Project will operate 24-hour seven days per week

Per the *Seaton Commerce Center Traffic Impact Analysis* prepared by Urban Crossroads, Inc. the Project is expected to generate a total of approximately 434 trip-ends per day (actual vehicles) and includes 118 truck trip-ends per day. (2) This noise study relies on the actual 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: SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (5) 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. (6) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

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

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (5)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those

sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (7)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (5)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an “out of sight, out of mind” effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (7)

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (7)

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. (8)

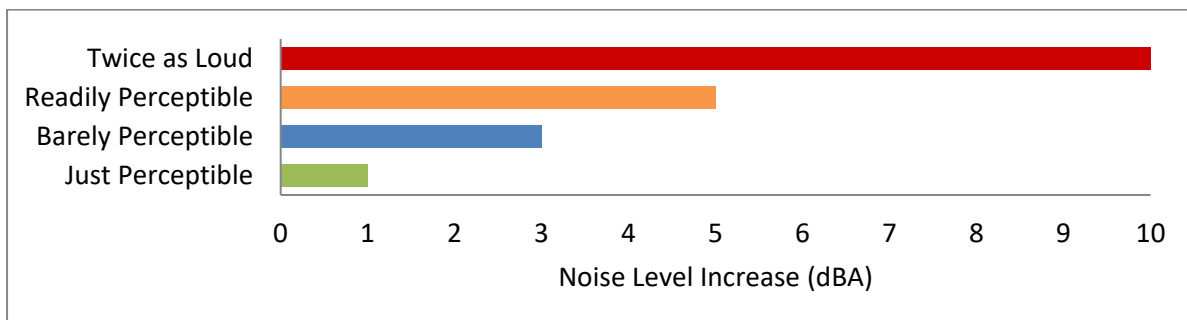
2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (9) 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. (9) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (7)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



Based on the U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch Highway Traffic Noise Analysis and Abatement Policy and Guidance, December 2011

2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (10)

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

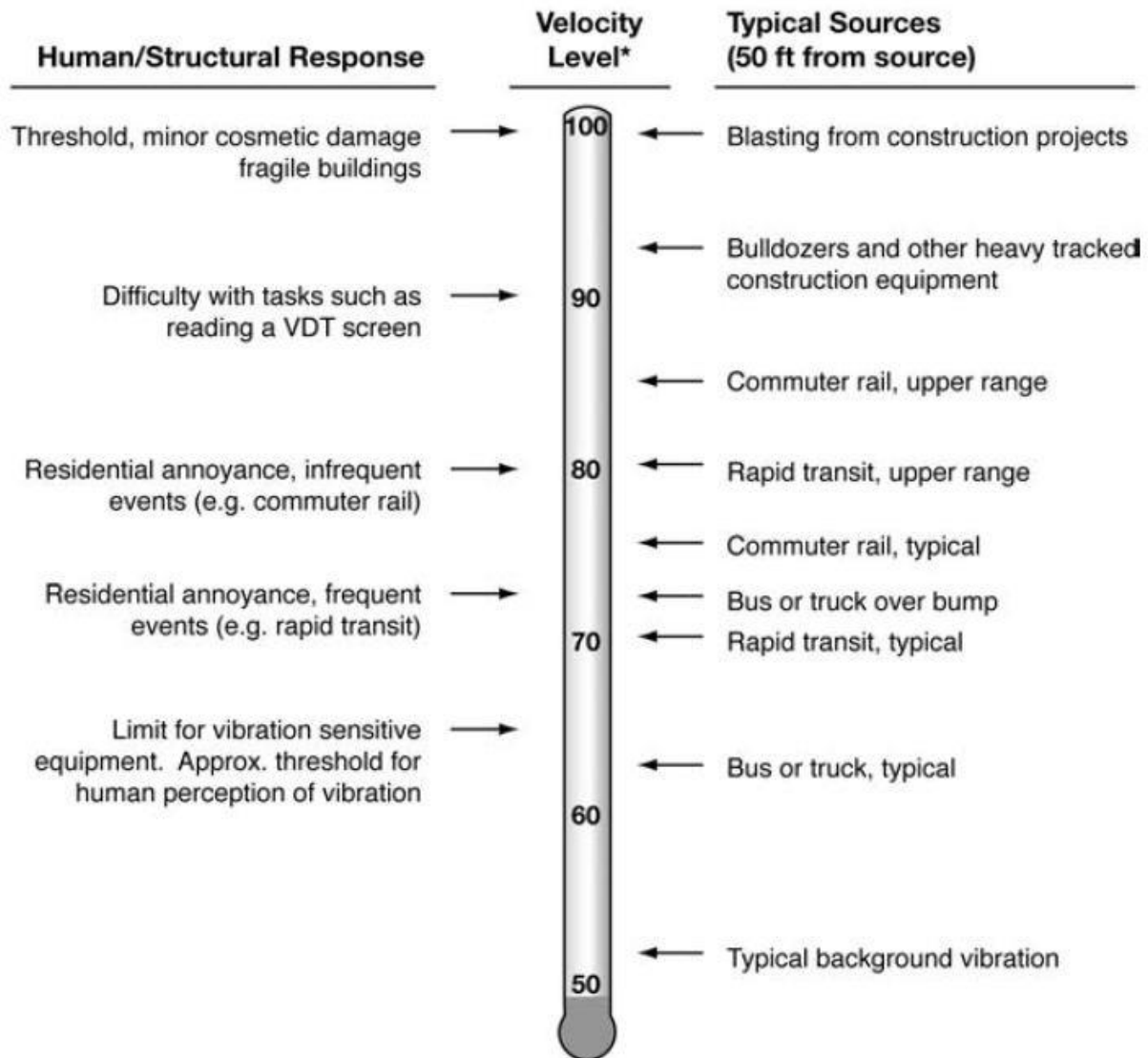
2.9 VIBRATION

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

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

distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), vibration-sensitive equipment and/or activities.

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

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

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

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

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3 REGULATORY SETTING

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

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

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

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

3.3 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

The County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of County of Riverside from excessive exposure to noise. (13) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports

and railroads. In addition, the Noise Element identifies several policies to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect County of Riverside residents from excessive noise, the Noise Element contains the following policies related to the Project:

- N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.*
- N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:*
 - *Schools*
 - *Hospitals*
 - *Rest Homes*
 - *Long Term Care Facilities*
 - *Mental Care Facilities*
 - *Residential Uses*
 - *Libraries*
 - *Passive Recreation Uses*
 - *Places of Worship*
- N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.*
- N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:*
 - a. 45 dBA 10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.;*
 - b. 65 dBA 10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.*
- N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.*
- N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse impacts on surrounding areas.*
- N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:*
 - i. Temporary noise attenuation fences;*
 - ii. Preferential location and equipment; and*
 - iii. Use of current noise suppression technology and equipment.*
- N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.*

To ensure noise-sensitive land uses are protected from high levels of noise (N 1.1), Table N-1 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element identifies residential use as a noise-sensitive land use (N 1.3) and discourages new development in areas with 65 CNEL or greater

existing ambient noise levels. To prevent and mitigate noise impacts for its residents (N 1.5), County of Riverside requires noise attenuation measures for sensitive land use exposed to noise levels higher than 65 CNEL. Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. To prevent high levels of construction noise from impacting noise-sensitive land uses, policies N 13.1 through 13.3 identify construction noise mitigation requirements for new development located near existing noise-sensitive land uses. Policy 16.3 establishes the vibration perception threshold for rail-related vibration levels, used in this analysis as a threshold for determining potential vibration impacts due to Project construction. (13)

3.3.1 LAND USE COMPATIBILITY

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

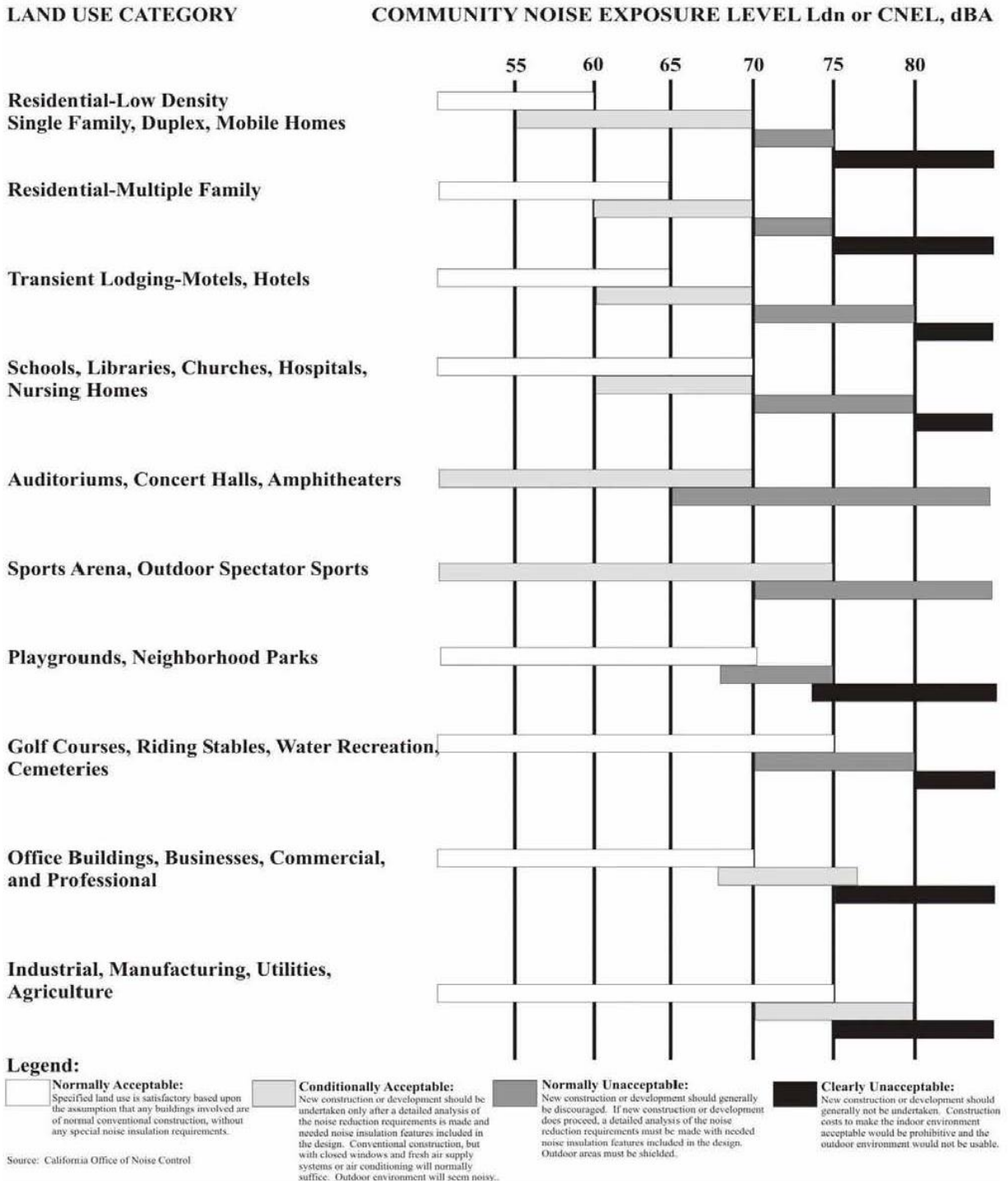
The *Land Use Compatibility for Community Noise Exposure* matrix describes categories of compatibility and not specific noise standards. The warehouse/industrial use of the Project is considered *normally acceptable* with unmitigated exterior noise levels of less than 70 dBA CNEL based on the *Industrial, Manufacturing, Utilities, Agriculture* land use compatibility criteria shown on Exhibit 3-A. Residential designated land uses in the Project study area are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels of up to 70 dBA CNEL. For *conditionally acceptable* exterior noise levels, approaching 80 dBA CNEL for Project land uses, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.* (13)

3.3.2 COUNTY OF RIVERSIDE STATIONARY NOISE STANDARDS

The County of Riverside has set exterior noise limits to control idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements associated with the development of the proposed Seaton Commerce Center. The County considers noise generated using motor vehicles to be a stationary noise source when operated on private property such as at a loading dock. These facility-related noises, as projected to any portion of any surrounding property containing a *habitable dwelling, hospital, school, library or nursing home*, must not exceed the following worst-case noise levels.

Policy N 4.1 of the Noise Element sets an exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. (13) Based on several discussions with the County of Riverside Department of Environmental Health

(DEH), Office of Industrial Hygiene (OIH), it is important to recognize that the County of Riverside Municipal Code noise level standards, incorrectly identify maximum noise level (L_{\max}) standards that should instead reflect the average L_{eq} noise levels. Moreover, the County of Riverside DEH OIH's April 15th, 2015 *Requirements for determining and mitigating, non-transportation noise source impacts to residential properties* also identifies operational (stationary-source) noise level limits using the L_{eq} metric consistent with the direction of the County of Riverside General Plan guidelines and standards Noise Element. Therefore, this report has been prepared consistent with the County of Riverside DEH OIH guidelines and standards using the L_{eq} noise level metric for stationary-source (operational) noise level evaluation.

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

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

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the County of Riverside has established limits to the hours of operation. Section 9.52.020 of the County's Noise Regulation ordinance indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (14) Neither the County's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*.

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

The Occupational Safety and Health Administration (OSHA) requires hearing protection be provided by employers in workplaces where the noise levels may, over long periods of exposure to high noise levels, endanger the hearing of their employees. Standard 29 CFR, Part 1910 indicates the noise levels under which a hearing conservation program is required to be provided to workers exposed to high noise levels. (10) This analysis does not evaluate the noise exposure of construction workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the nearby sensitive receiver locations in the Project study area.

3.5 VIBRATION STANDARDS

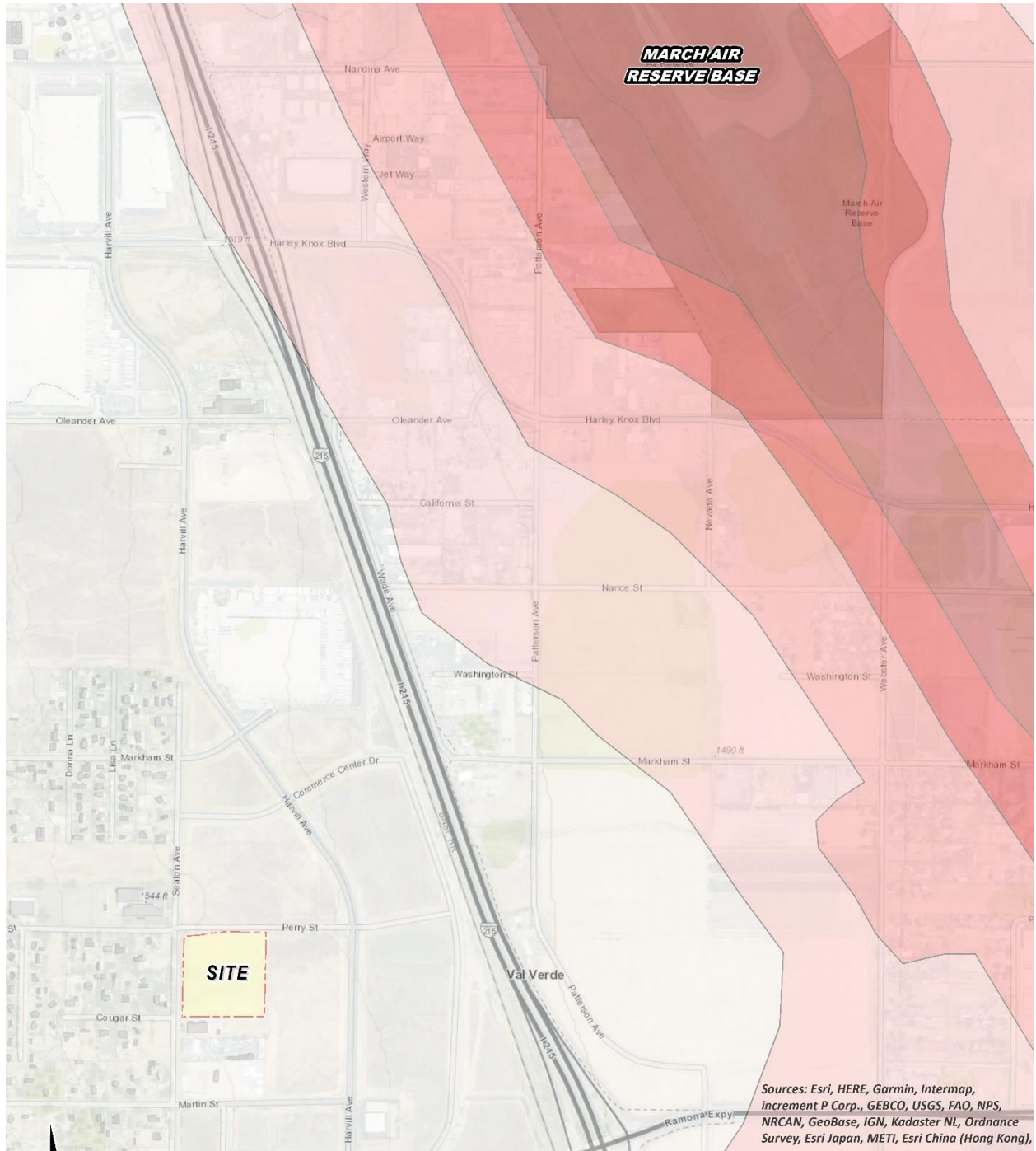
The County of Riverside does not have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.0787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. Further, County of Riverside General Plan Policy N 16.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz, which is used in this noise study to assess potential impacts due to Project construction vibration levels. (13)

3.6 MARCH AIR RESERVE BASE/INLAND PORT AIRPORT LAND USE COMPATIBILITY

The March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately 1.2 miles northeast of the Project site. The *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan* (MARB/IPA LUCP) includes the policies for determining the land use compatibility of the Project. The MARB/IPA, Map MA-1, indicates that the Project site is located within Compatibility Zone C2, which Table MA-1 Compatibility Zone Factors indicates is considered to have a *moderate* noise impact. Further, the Project site is located outside of the 60 dBA CNEL noise level contour boundary. Moreover, the Basic Compatibility Criteria, listed in Table MA-2 of the MARB/IPA LUCP identifies no prohibited uses other than highly noise-sensitive outdoor nonresidential uses (e.g., sports stadiums, concert halls). (16) The MARB/IPA LUCP does not identify industrial-use specific noise compatibility standards, and therefore, the County of Riverside *Land Use Compatibility for Community Noise Exposure* matrix, previously discussed in Section 3.3, is used to assess potential aircraft-related noise levels at the Project site. The County of Riverside guidelines indicate that industrial uses, such as the Project, are considered *normally acceptable* with exterior noise levels of up to 70 dBA CNEL. (13)

The noise contour boundaries of MARB/IPA are presented on Exhibit 3-B of this report and show that the Project is considered *normally acceptable* land use since it is located outside of the 60 dBA CNEL contour. Further, Table MA-2 indicates that no uses are prohibited in this area except for highly noise-sensitive outdoor nonresidential uses (e.g., sports stadiums, concert halls).

EXHIBIT 3-B: MARB/IPA FUTURE AIRPORT NOISE CONTOURS



4 SIGNIFICANCE CRITERIA

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

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

While the County of Riverside General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

CEQA GUIDELINES NOT FURTHER ANALYZED

As previously indicated in Section 3.6, the noise contour boundaries of MARB/IPA are presented on Exhibit 3-B of this report and show that the Project is considered *normally acceptable* land use since it is located outside the 60 dBA CNEL contour. Moreover, Table MA-2 of the MARB/IPA LUCP indicates that no uses are prohibited in this area except for highly noise-sensitive outdoor nonresidential uses (e.g., sports stadiums, concert halls), and therefore, impacts are considered *less than significant* and no further noise analysis is provided under Guideline C.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (17)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (18) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (17) 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 the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

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

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

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (13)

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

4.3 SIGNIFICANCE CRITERIA SUMMARY

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

OFF-SITE TRAFFIC NOISE

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

OPERATIONAL NOISE & VIBRATION

- If Project-related operational (stationary-source) noise levels exceed the exterior 65 dBA L_{eq} daytime or 45 dBA L_{eq} nighttime noise level standards at nearby sensitive receiver locations in the County of Riverside (County of Riverside General Plan Noise Element, Table N-2).
- 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 increase of greater than 1.5 dBA L_{eq} (FICON, 1992).
- If Project generated operational vibration levels exceed the County of Riverside acceptable vibration standard of 0.01 in/sec RMS at sensitive receiver locations (County of Riverside General Plan , Policy N 16.3).

CONSTRUCTION NOISE & VIBRATION

- If Project-related construction activities create noise levels which exceed the 85 dBA L_{eq} acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure);
- If short-term Project-generated construction vibration levels exceed the County of Riverside vibration standard of 0.01 in/sec RMS at sensitive receiver locations (County of Riverside General Plan Noise Element, Policy N 16.3).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	Noise-Sensitive ¹	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		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 ^{1,2}	If ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	Exterior Noise Level Standards ³	65 dBA L _{eq}	45 dBA L _{eq}
		If ambient is < 60 dBA L _{eq} 1	≥ 5 dBA L _{eq} Project increase	
		If ambient is 60 - 65 dBA L _{eq} 1	≥ 3 dBA L _{eq} Project increase	
		If ambient is > 65 dBA L _{eq} 1	≥ 1.5 dBA L _{eq} Project increase	
		Vibration Level Threshold ⁴	0.01 in/sec RMS	
Construction	Noise-Sensitive	Noise Level Threshold ⁵	85 dBA L _{eq}	
		Vibration Level Threshold ⁴	0.01 in/sec RMS	

¹ Source: FICON, 1992.

² Source: County of Riverside General Plan Noise Element, Table N-1.

³ Source: County of Riverside General Plan Noise Element, Table N-2.

⁴ Source: County of Riverside General Plan Noise Element, Policy N 16.3.

⁵ Acceptable threshold for construction noise based on the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health.

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at eight locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, November 6th, and Tuesday, December 11th, 2018. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (19)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources.* (5) Further, FTA guidance states, *that 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 north of the Project site on Seaton Avenue near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 68.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 65.2 dBA L_{eq} with an average nighttime noise level of 61.2 dBA L_{eq} .
- Location L2 represents the noise levels at northern boundary of the Project site on Perry Street near vacant land parcels. The noise level measurements collected show an overall 24-hour exterior noise level of 58.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 52.8 dBA L_{eq} with an average nighttime noise level of 51.1 dBA L_{eq} .
- Location L3 represents the noise levels east of the Project site, near the intersection of Perry Street and Harvill Avenue. The 24-hour CNEL indicates that the overall exterior noise level is 64.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 63.3 dBA L_{eq} with an average nighttime noise level of 56.0 dBA L_{eq} .
- Located south of the Project site, location L4 represents the noise levels on Martin Street near White House Sanitation. The noise level measurements collected show an overall 24-hour exterior noise level of 64.5 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 60.1 dBA L_{eq} with an average nighttime noise level of 57.3 dBA L_{eq} .
- Location L5 represents the noise levels south of the Project site, on Seaton Avenue, near existing single-family residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 64.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 59.4 dBA L_{eq} with an average nighttime noise level of 58.0 dBA L_{eq} .
- Location L6 represents the noise levels adjacent to the Project site near existing industrial and residential uses across Seaton Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 65.7 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 61.1 dBA L_{eq} with an average nighttime noise level of 58.6 dBA L_{eq} .
- Location L7 represents the noise levels north of the Project site on Seaton Avenue adjacent to existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 61.2 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 56.8 dBA L_{eq} with an average nighttime noise level of 54.0 dBA L_{eq} .
- Location L8 represents the noise levels adjacent to the Project's western site boundary on Seaton Avenue near existing residences and industrial uses. The noise level measurements collected show an overall 24-hour exterior noise level of 64.0 dBA CNEL. The energy

(logarithmic) average daytime noise level was calculated at 62.0 dBA L_{eq} with an average nighttime noise level of 55.5 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 I-215 and the MARB/IPA, in addition to background industrial land use activities. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

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

Location ¹	Distance to Project Boundary (Feet)	Description	Energy Average Noise Level (dBA L _{eq}) ²		CNEL
			Daytime	Nighttime	
L1	1,215'	Located north of the Project site on Seaton Avenue near existing residential homes.	65.2	61.2	68.8
L2	68'	Located at northern boundary of the Project site on Perry Street near vacant land parcels.	52.8	51.1	58.0
L3	550'	Located east of the Project site, near the intersection of Perry Street and Harvill Avenue.	63.3	56.0	64.8
L4	670'	Located south of the Project site, on Martin Street near White House Sanitation.	60.1	57.3	64.5
L5	720'	Located south of the Project site, on Seaton Avenue, near existing single-family residential homes.	59.4	58.0	64.8
L6	108'	Located adjacent to the Project site near existing industrial and residential uses across Seaton Avenue.	61.1	58.6	65.7
L7	610'	Located north of the Project site on Seaton Avenue adjacent to existing residential homes.	56.8	54.0	61.2
L8	30'	Located adjacent to the Project's western site boundary on Seaton Avenue near existing residences and industrial uses.	62.0	55.5	64.0

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



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6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (20) 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. (21) 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. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (22)

This methodology is consistent with the County of Riverside Office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*, which specifically requires the FHWA RD-77-108 model to be used in analysis within the County's jurisdiction. (23)

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 six study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of Riverside General Plan Circulation Element, and the posted vehicle speeds. Where posted vehicle speeds are unavailable, the 40 mph speed identified in the County of Riverside Office of Industrial Hygiene Noise Study Guidelines is used. The ADT volumes used in this study are presented on Table 6-2 are based on the *Seaton Commerce Center Traffic Impact Analysis*, prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing (2018), Existing plus Ambient Growth (EA) (2020), and EA plus Cumulative (EAC) (2020). (2)

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Planned (Existing if Different) Land Use ¹	Distance from Centerline to Nearest Adjacent Land Use (Feet) ²	Vehicle Speed (mph) ³
1	Seaton Av.	n/o Perry St.	Light Industrial/Residential	50'	40
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	50'	40
3	Markham St.	w/o Seaton Av.	Residential	50'	45
4	Markham St.	e/o Seaton Av.	Light Industrial	50'	45
5	Perry St.	w/o Dwy. 1	Light Industrial	50'	40
6	Perry St.	e/o Dwy. 1	Light Industrial	50'	40
7	Perry St.	e/o Dwy. 2	Light Industrial	50'	40

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.

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 Element.

³ Sources: Seaton Commerce Center Traffic Impact Analysis, prepared by Urban Crossroads, Inc. and the County of Riverside Office of Industrial Hygiene noise study guidelines.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes ¹					
			Existing (2018)		Existing + Ambient Growth (EA) (2020)		EA + Cumulative Development (EAC) (2020)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Seaton Av.	n/o Perry St.	1,981	2,028	2,061	2,108	2,097	2,144
2	Seaton Av.	s/o Perry St.	1,866	1,929	1,941	2,004	1,977	2,040
3	Markham St.	w/o Seaton Av.	14,639	14,648	15,230	15,240	15,938	15,948
4	Markham St.	e/o Seaton Av.	15,198	15,236	15,812	15,850	16,576	16,614
5	Perry St.	w/o Dwy. 1	140	250	145	256	145	224
6	Perry St.	e/o Dwy. 1	140	219	145	224	145	224
7	Perry St.	e/o Dwy. 2	140	463	145	469	145	469

¹ Source: Seaton Commerce Center Traffic Impact Analysis, Urban Crossroads, Inc.

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.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact*

Analysis. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios. Due to the added Project truck trips, the increase in Project traffic volumes and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and future traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	75.54%	13.96%	10.50%	100.00%
Medium Trucks	48.91%	2.17%	48.91%	100.00%
Heavy Trucks	47.30%	5.40%	47.30%	100.00%

Source: County of Riverside Office of Industrial Hygiene. 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			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	84.94%	7.83%	7.23%	100.00%

Based on an existing vehicle count taken at Seaton Avenue and Perry Street (Seaton Commerce Center Traffic Impact Analysis, Urban Crossroads, Inc.) 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	Seaton Av.	n/o Perry St.	85.29%	7.65%	7.06%	100.00%
2	Seaton Av.	s/o Perry St.	85.43%	7.57%	6.99%	100.00%
3	Markham St.	w/o Seaton Av.	84.95%	7.83%	7.22%	100.00%
4	Markham St.	e/o Seaton Av.	84.98%	7.81%	7.21%	100.00%
5	Perry St.	w/o Dwy. 1	91.59%	4.37%	4.04%	100.00%
6	Perry St.	e/o Dwy. 1	90.38%	5.00%	4.62%	100.00%
7	Perry St.	e/o Dwy. 2	69.98%	8.41%	21.61%	100.00%

¹ Source: Seaton Commerce Center Traffic Impact Analysis, Urban Crossroads, Inc.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: EXISTING PLUS AMBIENT GROWTH (EA) WITH PROJECT CONDITIONS VEHICLE MIX

ID	Roadway	Segment	With Project ¹			
			Autos	Medium Trucks	Heavy Trucks	Total ²
1	Seaton Av.	n/o Perry St.	85.28%	7.66%	7.07%	100.00%
2	Seaton Av.	s/o Perry St.	85.41%	7.58%	7.00%	100.00%
3	Markham St.	w/o Seaton Av.	84.95%	7.83%	7.22%	100.00%
4	Markham St.	e/o Seaton Av.	84.98%	7.81%	7.21%	100.00%
5	Perry St.	w/o Dwy. 1	91.45%	4.45%	4.11%	100.00%
6	Perry St.	e/o Dwy. 1	90.24%	5.07%	4.68%	100.00%
7	Perry St.	e/o Dwy. 2	70.16%	8.40%	21.44%	100.00%

¹ Source: Seaton Commerce Center Traffic Impact Analysis, Urban Crossroads, Inc.² Total of vehicle mix percentage values rounded to the nearest one-hundredth.**TABLE 6-7: EA PLUS CUMULATIVE WITH PROJECT CONDITIONS VEHICLE MIX**

ID	Roadway	Segment	With Project ¹			
			Autos	Medium Trucks	Heavy Trucks	Total ²
1	Seaton Av.	n/o Perry St.	85.27%	7.66%	7.07%	100.00%
2	Seaton Av.	s/o Perry St.	85.41%	7.59%	7.01%	100.00%
3	Markham St.	w/o Seaton Av.	84.95%	7.83%	7.22%	100.00%
4	Markham St.	e/o Seaton Av.	84.97%	7.81%	7.21%	100.00%
5	Perry St.	w/o Dwy. 1	90.24%	5.07%	4.68%	100.00%
6	Perry St.	e/o Dwy. 1	90.24%	5.07%	4.68%	100.00%
7	Perry St.	e/o Dwy. 2	70.16%	8.40%	21.44%	100.00%

¹ Source: Seaton Commerce Center Traffic Impact Analysis, Urban Crossroads, Inc.² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

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

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

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, September 2018.

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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Seaton Commerce Center 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 (2018) Without / With Project:
 - This scenario refers to the Existing present-day noise conditions, without and with the proposed Project.
- Existing plus Ambient Growth (EA) (2020) Without / With Project:
 - This scenario below refers to the background noise conditions at future Year 2020 without and with the proposed Project plus ambient growth.
- EA plus Cumulative (EAC) (2020) Without / With Project:
 - This scenario below refers to the background noise conditions at future Year 2020 without and with the proposed Project plus ambient growth, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the study area roadway segments analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing (2018), Existing plus Ambient Growth (EA) (2020), and EA plus Cumulative (EAC) (2020). Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING 2018 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.4	RW	73	157
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.2	RW	70	150
3	Markham St.	w/o Seaton Av.	Residential	77.0	147	317	683
4	Markham St.	e/o Seaton Av.	Light Industrial	77.2	151	325	701
5	Perry St.	w/o Dwy. 1	Light Industrial	55.9	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	55.9	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	55.9	RW	RW	RW

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING 2018 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.4	RW	73	157
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.2	RW	70	151
3	Markham St.	w/o Seaton Av.	Residential	77.0	147	317	683
4	Markham St.	e/o Seaton Av.	Light Industrial	77.2	151	325	701
5	Perry St.	w/o Dwy. 1	Light Industrial	56.2	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	56.1	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	64.9	RW	RW	106

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

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

ID	Road	Segment	Adjacent 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.6	RW	75	161
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.3	RW	72	154
3	Markham St.	w/o Seaton Av.	Residential	77.2	151	326	702
4	Markham St.	e/o Seaton Av.	Light Industrial	77.4	155	334	719
5	Perry St.	w/o Dwy. 1	Light Industrial	56.1	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	56.1	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	56.1	RW	RW	RW

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

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

ID	Road	Segment	Adjacent 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.6	RW	75	161
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.4	RW	72	155
3	Markham St.	w/o Seaton Av.	Residential	77.2	151	326	702
4	Markham St.	e/o Seaton Av.	Light Industrial	77.4	155	334	720
5	Perry St.	w/o Dwy. 1	Light Industrial	56.4	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	56.3	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	64.9	RW	RW	107

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: EAC 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.7	RW	75	163
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.4	RW	73	156
3	Markham St.	w/o Seaton Av.	Residential	77.4	156	336	723
4	Markham St.	e/o Seaton Av.	Light Industrial	77.6	160	345	742
5	Perry St.	w/o Dwy. 1	Light Industrial	56.1	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	56.1	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	56.1	RW	RW	RW

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

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

ID	Road	Segment	Adjacent 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	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.7	RW	76	163
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.4	RW	73	157
3	Markham St.	w/o Seaton Av.	Residential	77.4	156	336	723
4	Markham St.	e/o Seaton Av.	Light Industrial	77.6	160	345	743
5	Perry St.	w/o Dwy. 1	Light Industrial	56.3	RW	RW	RW
6	Perry St.	e/o Dwy. 1	Light Industrial	56.3	RW	RW	RW
7	Perry St.	e/o Dwy. 2	Light Industrial	64.9	RW	RW	107

¹ Source: Mead Valley Area Plan, Land Use Plan, Figure 3.² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITIONS 2018 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

An analysis of Existing 2018 traffic noise levels plus traffic noise generated by the proposed Project has been included in this report. However, the analysis of existing traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2020 cumulative conditions.

Table 7-1 shows the Existing 2018 without Project conditions CNEL noise levels. The Existing 2018 without Project exterior noise levels are expected to range from 55.9 to 77.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. As shown on Table 7-7 the Project will generate a noise level increase ranging from 0.0 to 9.0 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Existing with Project conditions for receivers located adjacent to the roadway segment of Perry Street east of Driveway 2. All other roadway segments are shown to experience *less than significant* noise level impacts under Existing plus Project conditions.

Since all the Project truck traffic is planned to use Perry Street east of Driveway 2, it is reasonable to expect that this roadway segment will experience *potentially significant* Project-related noise level increases. However, it is important to recognize that these impacts are largely a function of the low existing traffic volumes related the unimproved nature of the existing dirt road and the addition of the Project truck traffic. A review of the property located adjacent to Perry Street east of Driveway 2 shows that this area is currently vacant and without receivers of any kind (noise sensitive or non-noise sensitive). Therefore, with no receivers experiencing a traffic noise level increase on this segment, the Existing with Project off-site traffic impacts are *less than significant*.

TABLE 7-7: UNMITIGATED EXISTING 2018 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Adjacent Planned (Existing) Land Use ¹	CNEL at Adjacent Land Use (dBA) ¹			Noise- Sensitive Land Use?
				No Project	With Project	Project Addition	
1	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.4	67.4	0.0	Yes
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.2	67.2	0.0	Yes
3	Markham St.	w/o Seaton Av.	Residential	77.0	77.0	0.0	Yes
4	Markham St.	e/o Seaton Av.	Light Industrial	77.2	77.2	0.0	No
5	Perry St.	w/o Dwy. 1	Light Industrial	55.9	56.2	0.3	No
6	Perry St.	e/o Dwy. 1	Light Industrial	55.9	56.1	0.2	No
7	Perry St.	e/o Dwy. 2	Light Industrial	55.9	64.9	9.0	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. Values rounded to the nearest one-tenth.

7.3 EA 2020 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the EA 2020 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels are expected to range from 56.1 to 77.4 dBA CNEL without the Project. Table 7-4 presents the EA 2020 with Project conditions noise level contours that are expected to range from 56.3 to 77.4 dBA CNEL. Note that the Existing and Existing plus Ambient (EA) 2020 with Project conditions both represent worst-case Year 2020 conditions which assume the Project will be built and fully occupied for the purposes of analysis and consistency with the *Traffic Impact Analysis*. (2)

As shown on Table 7-8 the Project will generate a noise level increase ranging from 0.0 to 8.8 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Existing with Project conditions for receivers located adjacent to the roadway segment of Perry Street east of Driveway 2. All other roadway segments are shown to experience *less than significant* noise level impacts under Existing plus Project conditions.

Since all the Project truck traffic is planned to use Perry Street east of Driveway 2, it is reasonable to expect that this roadway segment will experience *potentially significant* Project-related noise level increases. However, it is important to recognize that these impacts are largely a function of the low existing traffic volumes related the unimproved nature of the existing dirt road and the addition of Project truck traffic. A review of the property located adjacent to Perry Street east of Driveway 2 shows that this area is currently vacant and without receivers of any kind (noise sensitive or non-noise sensitive). Therefore, with no receivers experiencing a traffic noise level increase on this segment, the EA 2020 off-site traffic impacts are *less than significant*.

TABLE 7-8: UNMITIGATED EA (2020) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Adjacent Planned (Existing) Land Use ¹	CNEL at Adjacent Land Use (dBA) ¹			Noise- Sensitive Land Use?	Threshold Exceeded? ²
				No Project	With Project	Project Addition		
1	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.6	67.6	0.0	Yes	No
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.3	67.4	0.0	Yes	No
3	Markham St.	w/o Seaton Av.	Residential	77.2	77.2	0.0	Yes	No
4	Markham St.	e/o Seaton Av.	Light Industrial	77.4	77.4	0.0	No	No
5	Perry St.	w/o Dwy. 1	Light Industrial	56.1	56.4	0.3	No	No
6	Perry St.	e/o Dwy. 1	Light Industrial	56.1	56.3	0.2	No	No
7	Perry St.	e/o Dwy. 2	Light Industrial	56.1	64.9	8.8	No	Yes

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.
Values rounded to the nearest one-tenth.

7.4 EAC 2020 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-9 presents a comparison of the EAC 2020 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels are expected to range from 56.1 to 77.4 dBA CNEL without the Project. Table 7-6 presents the EAC 2020 with Project conditions noise level contours that are expected to range from 56.1 to 77.6 dBA CNEL.

As shown on Table 7-9 the Project will generate a noise level increase ranging from 0.0 to 8.8 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *potentially significant* under Existing with Project conditions for receivers located adjacent to the roadway segment of Perry Street east of Driveway 2. All other roadway segments are shown to experience *less than significant* noise level impacts under Existing plus Project conditions.

Since all the Project truck traffic is planned to use Perry Street east of Driveway 2, it is reasonable to expect that this roadway segment will experience *potentially significant* Project-related noise level increases. However, it is important to recognize that these impacts are largely a function of the low existing traffic volumes related the unimproved nature of the existing dirt road and the addition of Project truck traffic. A review of the property located adjacent to Perry Street east of Driveway 2 shows that this area is currently vacant and without receivers of any kind (noise sensitive or non-noise sensitive). Therefore, with no receivers experiencing a traffic noise level increase on this segment, the EAC 2020 off-site traffic impacts are *less than significant*.

TABLE 7-9: UNMITIGATED EAC 2020 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Adjacent Planned (Existing) Land Use ¹	CNEL at Adjacent Land Use (dBA) ¹			Noise- Sensitive Land Use?	Threshold Exceeded? ²
				No Project	With Project	Project Addition		
1	Seaton Av.	n/o Perry St.	Light Industrial/Residential	67.7	67.7	0.0	Yes	No
2	Seaton Av.	s/o Perry St.	Light Industrial/Residential	67.4	67.4	0.0	Yes	No
3	Markham St.	w/o Seaton Av.	Residential	77.4	77.4	0.0	Yes	No
4	Markham St.	e/o Seaton Av.	Light Industrial	77.6	77.6	0.0	No	No
5	Perry St.	w/o Dwy. 1	Light Industrial	56.1	56.3	0.2	No	No
6	Perry St.	e/o Dwy. 1	Light Industrial	56.1	56.3	0.2	No	No
7	Perry St.	e/o Dwy. 2	Light Industrial	56.1	64.9	8.8	No	Yes

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.
Values rounded to the nearest one-tenth.

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8 SENSITIVE RECEIVER LOCATIONS

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

Consistent with the Seaton Commerce Center Air Quality Impact Analysis (24), six sensitive receiver locations in the vicinity of the Project site were identified. The sensitive receiver locations shown on Exhibit 8-A describe the nearest locations where an individual can stay for a 24-hour period. The nearest receiver to the Project site is R3, which is an existing residential home located approximately 90 feet on the northwest corner of Cougar Street and Seaton Avenue, west of the Project Site. All distances are measured from the Project site boundary to the outdoor living areas (e.g., backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2.

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

- R1: Located approximately 745 feet northwest of the Project site, R1 represents existing residential homes west of Seaton Avenue. A 24-hour noise measurement was taken near this location, L7, to describe the existing ambient noise environment.
- R2: Location R2 represents the existing residential homes located west of the Project site at roughly 109 feet west of Seaton Avenue. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.
- R3: Location R3 represents the existing residential use west of Seaton Avenue at approximately 90 feet, west of the Project site. A 24-hour noise measurement near this location, L8, is used to describe the existing ambient noise environment.
- R4: Location R4 represents the existing residential homes southwest of the Project site, south of Cougar Street, at roughly 332 feet. A 24-hour noise measurement near this location, L8, is used to describe the existing ambient noise environment.

- R5: Located approximately 360 feet southwest of the Project site, R5 represents an existing residential home west of Seaton Avenue. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.
- R6: Location R6 represents the existing residential homes located southwest of the Project site at roughly 726 feet, west of Seaton Avenue. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS



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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed Seaton Commerce Center Project. Exhibit 9-A identifies the representative noise source locations used to assess the operational noise levels. Appendix 9.1 includes the detailed calculations for the Project operational noise levels presented in this section.

9.1 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

9.2 OPERATIONAL 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, roof-top air conditioning units, and parking lot vehicle movements all operating continuously. These sources noise activity will likely vary throughout the day. Appendix 9.2 provides reference measurement photos for each noise source.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (19)

9.2.2 TRUCK IDLING, DELIVERIES, BACKUP ALARMS, UNLOADING/LOADING, AND DOCKING

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building, of

roughly 285,000 square feet, with a loading dock area on the western side of the building façade. Up to ten trucks were observed in the loading dock area including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA L_{eq} at a uniform reference distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine, idling, and air brakes noise, in addition to on-going idling of an already docked truck.

9.2.3 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 over a four-day total duration 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 mechanical roof-top air conditioning units on the roof of an existing Walmart store, with additional roof-top units operating in the background. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning units. At 5 feet from the closest roof-top air conditioning unit, the highest exterior noise level from all four days of the measurement period was 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.

9.2.4 PARKING LOT VEHICLE MOVEMENTS

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., 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. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins) ⁴	Reference Noise Level (dBA L _{eq})	
					@ Ref. Dist.	@ 50 Feet
Truck Unloading/Docking Activity ¹	00:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Units ²	96:00:00	5'	5'	60	77.2	57.2
Parking Lot Vehicle Movements ³	01:00:00	10'	5'	60	52.2	41.7

¹ Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino on Wednesday, January 7, 2015.

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 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.

⁴ 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.

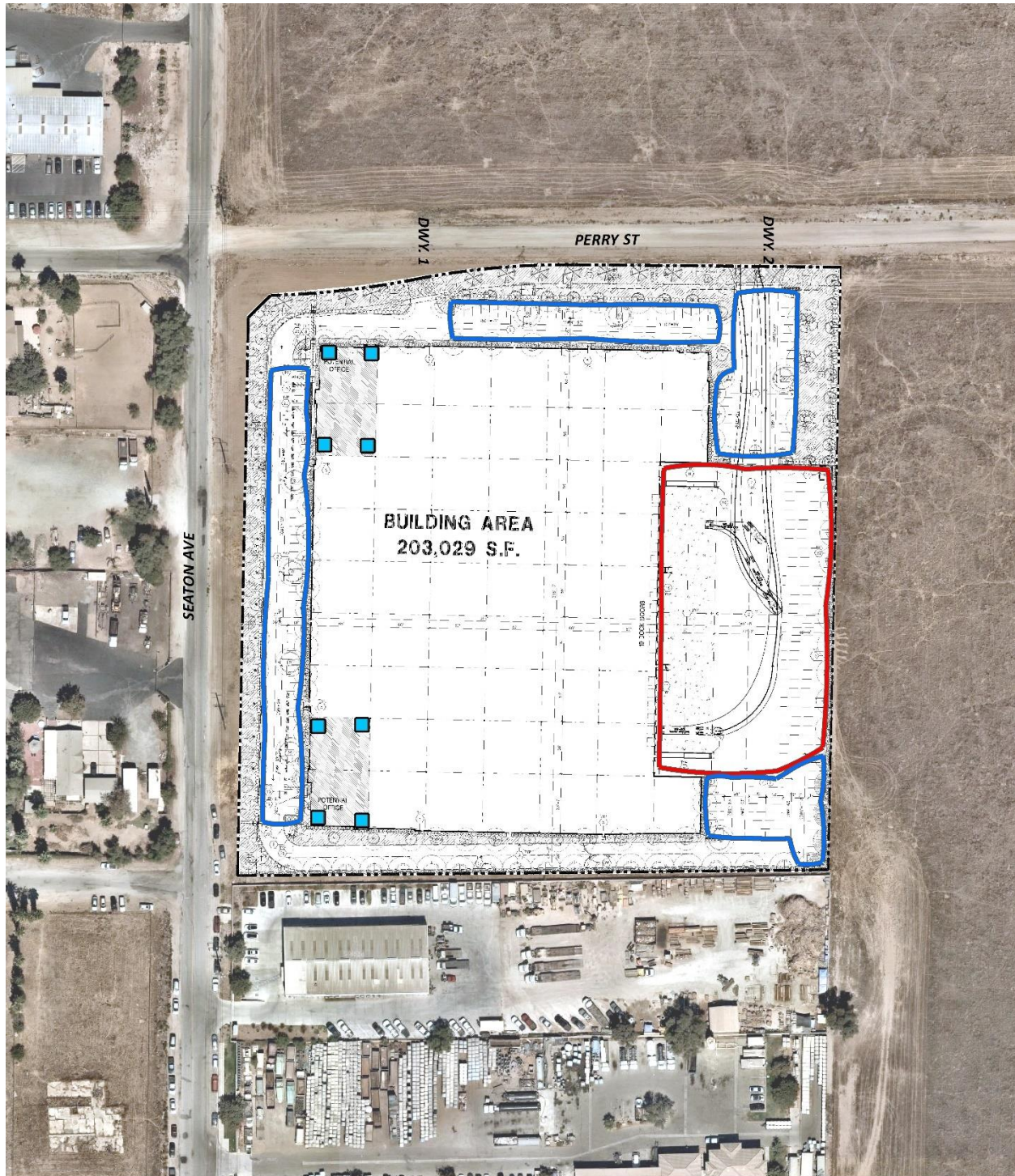
9.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at 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 (SPL₁):

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

Where SPL₂ is the resulting noise level after attenuation, SPL₁ is the source noise level, D₂ is the distance to the reference sound pressure level (SPL₁), and D₁ is the distance to the receiver location. Table 9-2 shows the individual operational noise levels of each noise source at each of the nearby sensitive receiver locations. As indicated on Table 9-2, the Project-only operational noise levels will range from 29.6 to 41.9 dBA L_{eq} at the sensitive receiver locations. The Project operational noise level calculations include an estimated 5-foot high parapet screen wall for the roof-top air conditioning units.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



LEGEND:

- Roof-Top Air Conditioning Unit
- Parking Lot Vehicle Movements
- Distribution/Warehouse Activity

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

Receiver Location ¹	Noise Levels by Noise Source (dBA L _{eq}) ²			Combined Operational Noise Levels (dBA L _{eq})
	Truck Unloading/ Docking Activity	Roof-Top Air Conditioning Units ³	Parking Lot Vehicle Movements	
R1	18.5	27.9	23.4	29.6
R2	24.2	39.7	35.2	41.1
R3	24.7	40.2	36.6	41.9
R4	21.3	33.4	28.6	34.8
R5	22.3	33.1	27.9	34.5
R6	19.0	28.1	23.8	29.8

¹ See Exhibit 9-A for the receiver and noise source locations.

² Reference noise sources as shown on Table 9-1. Individual noise source calculations are provided in Appendix 9.1.

³ Includes estimated 5-foot high parapet screen wall.

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the County of Riverside exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-3 shows the operational noise levels associated with Seaton Commerce Center Project will satisfy the County of Riverside 65 dBA L_{eq} daytime and 45 dBA L_{eq} nighttime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 9-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location ¹	Noise Level at Receiver Locations (dBA L _{eq}) ²	Threshold Exceeded? ³	
		Daytime (65 dBA L _{eq})	Nighttime (45 dBA L _{eq})
R1	29.6	No	No
R2	41.1	No	No
R3	41.9	No	No
R4	34.8	No	No
R5	34.5	No	No
R6	29.8	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 standards?

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

9.4 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (5) Instead, they must be logarithmically added using the following base equation:

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

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

As indicated on Tables 9-4 and 9-5, the Project will generate an unmitigated daytime operational noise level increase of up to 0.0 dBA L_{eq} and an unmitigated nighttime operational noise level increase of up to 0.2 dBA L_{eq} at the nearby receiver locations. Since the Project-related operational noise level contributions will satisfy the operational noise level increase significance criteria presented on Table 4-2, the increases at the sensitive receiver locations will be *less than significant*.

TABLE 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location ¹	Total Project Operational Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels ⁴	Combined Project and Ambient ⁵	Project Increase ⁶	Threshold ⁷	Threshold Exceeded? ⁷
R1	29.6	L7	56.8	56.8	0.0	5.0	No
R2	41.1	L6	61.1	61.1	0.0	3.0	No
R3	41.9	L8	62.0	62.0	0.0	3.0	No
R4	34.8	L8	62.0	62.0	0.0	3.0	No
R5	34.5	L5	59.4	59.4	0.0	5.0	No
R6	29.8	L5	59.4	59.4	0.0	5.0	No

¹ See Exhibit 9-A for the sensitive receiver locations.

² Total Project operational noise levels as shown on Table 9-3.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed daytime ambient noise levels as shown on Table 5-1.

⁵ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the proposed Project activities.

⁷ Significance Criteria as defined in Section 4.

TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location ¹	Total Project Operational Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels ⁴	Combined Project and Ambient ⁵	Project Increase ⁶	Threshold ⁷	Threshold Exceeded? ⁷
R1	29.6	L7	54.0	54.0	0.0	5.0	No
R2	41.1	L6	58.6	58.7	0.1	5.0	No
R3	41.9	L8	55.5	55.7	0.2	5.0	No
R4	34.8	L8	55.5	55.5	0.0	5.0	No
R5	34.5	L5	58.0	58.0	0.0	5.0	No
R6	29.8	L5	58.0	58.0	0.0	5.0	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 nighttime ambient noise levels as shown on Table 5-1.

⁵ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the proposed Project activities.

⁷ Significance Criteria as defined in Section 4.

9.5 REFLECTION

Field studies conducted by the FHWA have shown that the reflection from barriers and buildings does not substantially increase noise levels. (7) If all the noise striking a structure was reflected back to a given receiving point, the increase would be theoretically limited to 3 dBA. Further, not all the acoustical energy is reflected back to same point. Some of the energy would go over the structure, some is reflected to points other than the given receiving point, some is scattered by ground coverings (e.g., grass and other plants), and some is blocked by intervening structures and/or obstacles (e.g., the noise source itself). Additionally, some of the reflected energy is lost due to the longer path that the noise must travel. FHWA measurements made to quantify reflective increases in traffic noise have not shown an increase of greater than 1-2 dBA; an increase that is not perceptible to the average human ear.

9.6 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities the County of Riverside threshold for vibration of 0.01 in/sec RMS is used. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. According to the FTA *Transit Noise Impact and Vibration Assessment*. (3) trucks rarely create vibration that exceeds 70 VdB or 0.003 in/sec RMS (4) (unless there are bumps due to frequent potholes in the road. Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the County of Riverside 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 noise source locations in relation to the nearby sensitive receiver locations previously described in Section 8.

10.1 CONSTRUCTION NOISE SOURCES

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, based on the construction stages used in this analysis are consistent with the *Seaton Commerce Center Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (24)

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

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

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 of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS



LEGEND:



● Receiver Locations

— Distance from receiver to Project site boundary (in feet)



Construction Activity



Off-Site Utility & Infrastructure Improvements

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L _{eq})	Reference Noise Levels @ 50 Feet (dBA L _{eq}) ⁵
1	Truck Pass-Bys & Dozer Activity ¹	0:01:15	30'	63.6	59.2
2	Dozer Activity ¹	0:01:00	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities ²	0:01:00	30'	71.9	67.5
4	Foundation Trenching ²	0:01:01	30'	72.6	68.2
5	Rough Grading Activities ²	0:05:00	30'	77.9	73.5
6	Framing ³	0:02:00	30'	66.7	62.3
7	Dozer Pass-By ⁴	0:00:32	30'	84.0	79.6
8	Concrete Mixer Truck Movements ⁵	0:01:00	50'	71.2	71.2
9	Concrete Paver Activities ⁵	0:01:00	30'	70.0	65.6
10	Concrete Mixer Pour & Paving Activities ⁵	0:01:00	30'	70.3	65.9
11	Concrete Mixer Backup Alarms & Air Brakes ⁵	0:00:20	50'	71.6	71.6
12	Concrete Mixer Pour Activities ⁵	1:00:00	50'	67.7	67.7

¹ As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.

² As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.

³ As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.

⁴ As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.

⁵ Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.

⁶ Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

10.3 PROJECT CONSTRUCTION NOISE LEVELS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 10-2 to 10-6 present the short-term construction noise levels for each stage of construction. Table 10-7 provides a summary of the construction noise levels by stage at the nearby noise-sensitive receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the worst-case construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity to each receiver location.

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA L _{eq}) ³	Estimated Noise Barrier Attenuation (dBA L _{eq}) ⁴	Construction Noise Level (dBA L _{eq})
R1	745'	-23.5	0.0	56.1
R2	109'	-6.8	0.0	72.8
R3	90'	-5.1	0.0	74.5
R4	332'	-16.4	0.0	63.2
R5	360'	-17.1	0.0	62.5
R6	726'	-23.2	0.0	56.4

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 barriers/berms in the Project study area.

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

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

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	745'	-23.5	0.0	50.0
R2	109'	-6.8	0.0	66.7
R3	90'	-5.1	0.0	68.4
R4	332'	-16.4	0.0	57.1
R5	360'	-17.1	0.0	56.4
R6	726'	-23.2	0.0	50.3

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA L _{eq}) ³	Estimated Noise Barrier Attenuation (dBA L _{eq}) ⁴	Construction Noise Level (dBA L _{eq})
R1	745'	-23.5	0.0	44.7
R2	109'	-6.8	0.0	61.4
R3	90'	-5.1	0.0	63.1
R4	332'	-16.4	0.0	51.8
R5	360'	-17.1	0.0	51.1
R6	726'	-23.2	0.0	45.0

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Estimated barrier attenuation from existing barriers/berms in the Project study area.

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA L _{eq}) ³	Estimated Noise Barrier Attenuation (dBA L _{eq}) ⁴	Construction Noise Level (dBA L _{eq})
R1	745'	-23.5	0.0	48.1
R2	109'	-6.8	0.0	64.8
R3	90'	-5.1	0.0	66.5
R4	332'	-16.4	0.0	55.2
R5	360'	-17.1	0.0	54.5
R6	726'	-23.2	0.0	48.4

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 barriers/berms in the Project study area.

TABLE 10-6 ARCHITECTURAL COATING NOISE LEVELS

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

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA L _{eq}) ³	Estimated Noise Barrier Attenuation (dBA L _{eq}) ⁴	Construction Noise Level (dBA L _{eq})
R1	745'	-23.5	0.0	44.0
R2	109'	-6.8	0.0	60.7
R3	90'	-5.1	0.0	62.4
R4	332'	-16.4	0.0	51.1
R5	360'	-17.1	0.0	50.4
R6	726'	-23.2	0.0	44.3

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Estimated barrier attenuation from existing barriers/berms in the Project study area.

10.4 PROJECT CONSTRUCTION NOISE LEVEL CONTRIBUTIONS

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from primary Project construction activity to each of the nearby receiver locations. As shown on Table 10-7, the unmitigated construction noise levels are expected to range from 44.0 to 74.5 dBA L_{eq} at the nearby receiver locations.

TABLE 10-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location ¹	Construction Noise Level (dBA L _{eq})					
	Site Preparation	Grading	Building Construction	Architectural Coating	Paving	Highest Activity Noise Levels ²
R1	56.1	50.0	44.7	44.0	48.1	56.1
R2	72.8	66.7	61.4	60.7	64.8	72.8
R3	74.5	68.4	63.1	62.4	66.5	74.5
R4	63.2	57.1	51.8	51.1	55.2	63.2
R5	62.5	56.4	51.1	50.4	54.5	62.5
R6	56.4	50.3	45.0	44.3	48.4	56.4

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

To evaluate whether the Project will generate potentially significant short-term noise levels at off-site sensitive receiver locations a construction-related the NIOSH noise level threshold of 85 dBA L_{eq} is used as acceptable thresholds for construction noise at the nearby sensitive receiver locations. Table 10-8 shows the highest construction noise levels at the potentially impacted receiver locations are expected to approach 74.5 dBA L_{eq} and will satisfy the NIOSH 85 dBA L_{eq} significance threshold during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at all nearby sensitive receiver locations.

TABLE 10-8: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location ¹	Construction Noise Levels (dBA L _{eq})		
	Highest Construction Noise Levels ²	Threshold ³	Threshold Exceeded? ⁴
R1	56.1	85	No
R2	72.8	85	No
R3	74.5	85	No
R4	63.2	85	No
R5	62.5	85	No
R6	56.4	85	No

¹ Noise receiver locations are shown on Exhibit 10-A.² Estimated construction noise levels during peak operating conditions, as shown on Table 10-7.³ Construction noise thresholds as shown on Table 4-2.⁴ Do the estimated Project construction noise levels satisfy the construction noise level threshold?

OFF-SITE ROADWAY IMPROVEMENTS

Construction noise levels associated with off-site utility and infrastructure improvements may occur, however at this time, a specific schedule of off-site utility and infrastructure improvements is unknown. (24) Impacts associated with these activities are not expected to exceed the highest construction noise levels identified for on-site primary Project construction activities. As such, no impacts beyond what has already been identified in this report are expected to occur due to off-site utility and infrastructure improvements.

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 buildings, 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 10-9 presents the expected Project related vibration levels at the nearby receiver locations.

At distances ranging from 90 to 745 feet from Project construction activities, construction vibration velocity levels are expected to approach 0.009 in/sec RMS and will remain below the County of Riverside threshold of 0.01 in/sec RMS at all receiver locations, as shown on Table 10-9. Therefore, the Project-related vibration impacts are considered *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 10-9, approaching 0.013 in/sec PPV, are below the FTA vibration levels for building damage at the residential homes near the Project site. Moreover, 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 10-9: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver ¹	Distance to Const. Activity (Feet)	Receiver Levels (in/sec) PPV ²					Velocity Levels (in/sec) RMS ³	Threshold (in/sec) RMS ⁴	Threshold Exceeded? ⁵
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration			
R1	745'	0.000	0.000	0.000	0.001	0.001	0.000	0.01	No
R2	109'	0.000	0.004	0.008	0.010	0.010	0.007	0.01	No
R3	90'	0.000	0.005	0.011	0.013	0.013	0.009	0.01	No
R4	332'	0.000	0.001	0.002	0.002	0.002	0.001	0.01	No
R5	360'	0.000	0.001	0.001	0.002	0.002	0.001	0.01	No
R6	726'	0.000	0.000	0.000	0.001	0.001	0.000	0.01	No

¹ Receiver locations are shown on Exhibit 10-A.

² Based on the Vibration Source Levels of Construction Equipment included on Table 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 Source: County of Riverside General Plan Noise Element, Policy N 16.3.

⁵ Does the vibration level exceed the maximum acceptable vibration threshold?

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11 REFERENCES

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3. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
4. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* September 2013.
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6. **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.
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9. **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.
10. **Occupational Safety and Health Administration.** *Standard 29 CRF, Part 1910.*
11. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
12. **State of California.** *2016 California Green Building Standards Code.* January 2017.
13. **County of Riverside.** *General Plan Noise Element.* December 2015.
14. —. *Municipal Code, Chapter 9.52 Noise Regulation.*
15. **National Institute for Occupational Safety and Health.** *Criteria for Recommended Standard: Occupational Noise Exposure.* June 1998.
16. **Riverside County Airport Land Use Commission.** *March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan.* November 2014.
17. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
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21. **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.

22. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
23. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
24. **Urban Crossroads, Inc.** *Seaton Commerce Center Air Quality Impact Analysis.* April 2019.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Seaton Commerce Center 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:

COUNTY OF RIVERSIDE MUNICIPAL CODE

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9.52.010 - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the board of supervisors declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish county-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are established.

(Ord. 847 § 1, 2006)

9.52.020 - Exemptions.

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

- A. Facilities owned or operated by or for a governmental agency;
- B. Capital improvement projects of a governmental agency;
- C. The maintenance or repair of public properties;
- D. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;
- E. Public or private schools and school-sponsored activities;
- F. Agricultural operations on land designated "Agriculture" in the Riverside County general plan, or land zoned A-I (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), A-D (agriculture-dairy) or C/V (citrus/vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;
- G. Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348;
- H. Private construction projects located one-quarter of a mile or more from an inhabited dwelling;
- I. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:
 - 1. Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and
 - 2. Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May;
- J. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven a.m. and eight p.m.;
- K. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;
- L. Heating and air conditioning equipment;
- M. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare;
- N. The discharge of firearms consistent with all state laws.

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:11633 Study Area Photos



L1 East
33, 51' 5.380000", 117, 15' 40.700000"



L1 North
33, 51' 5.380000", 117, 15' 40.680000"



L1 South
33, 51' 5.340000", 117, 15' 40.700000"



L1 West
33, 51' 5.340000", 117, 15' 40.700000"



L2 East
33, 50' 54.030000", 117, 15' 38.510000"



L2 North
33, 50' 54.050000", 117, 15' 38.510000"

JN:11633 Study Area Photos



L2 South
33, 50' 54.050000", 117, 15' 38.510000"



L2 West
33, 50' 54.050000", 117, 15' 38.510000"



L3 East
33, 50' 53.970000", 117, 15' 26.780000"



L3 North
33, 50' 53.910000", 117, 15' 26.810000"



L3 South
33, 50' 53.970000", 117, 15' 26.810000"



L3 West
33, 50' 53.910000", 117, 15' 26.810000"

JN:11633 Study Area Photos



L4 East
33, 50' 40.750000", 117, 15' 36.250000"



L4 North
33, 50' 40.750000", 117, 15' 36.230000"



L4 South
33, 50' 40.750000", 117, 15' 36.250000"



L4 West
33, 50' 40.750000", 117, 15' 36.230000"



L5 East
33, 50' 40.710000", 117, 15' 40.210000"



L5 North
33, 50' 40.710000", 117, 15' 40.260000"

JN:11633 Study Area Photos



L5 South
33, 50' 40.710000", 117, 15' 40.240000"



L5 West
33, 50' 40.710000", 117, 15' 40.260000"



L6 East
33, 50' 54.230000", 117, 15' 41.200000"



L6 North
33, 50' 54.230000", 117, 15' 41.200000"



L6 South
33, 50' 54.170000", 117, 15' 41.200000"



L6 West
33, 50' 54.200000", 117, 15' 41.200000"

JN:11633 Study Area Photos



L7 East

,



L7 North

,



L7 South

,



L7 West

,



L8 East

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L8 North

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JN:11633 Study Area Photos



L8 South

,



L8 West

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

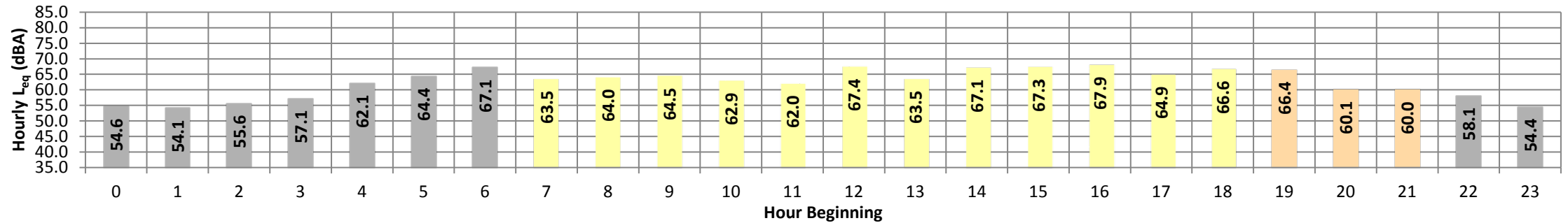
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L1 - Located north of the Project site on Seaton Avenue near existing residential homes.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}		
Night	0	54.6	75.9	44.8	65.0	63.0	59.0	57.0	52.0	50.0	48.0	47.0	46.0	54.6	10.0	64.6		
	1	54.1	76.3	42.4	67.0	63.0	56.0	53.0	48.0	46.0	45.0	44.0	44.0	54.1	10.0	64.1		
	2	55.6	82.2	41.8	68.0	62.0	56.0	54.0	48.0	45.0	43.0	43.0	42.0	55.6	10.0	65.6		
	3	57.1	72.6	43.0	69.0	67.0	63.0	61.0	54.0	50.0	45.0	44.0	44.0	57.1	10.0	67.1		
	4	62.1	87.2	45.3	72.0	70.0	68.0	65.0	59.0	54.0	48.0	47.0	46.0	62.1	10.0	72.1		
	5	64.4	83.7	46.1	75.0	72.0	69.0	68.0	62.0	58.0	51.0	50.0	47.0	64.4	10.0	74.4		
	6	67.1	87.6	49.2	77.0	75.0	71.0	70.0	65.0	61.0	56.0	55.0	52.0	67.1	10.0	77.1		
Day	7	63.5	82.5	49.3	74.0	71.0	68.0	66.0	62.0	59.0	54.0	53.0	51.0	63.5	0.0	63.5		
	8	64.0	84.7	50.1	75.0	73.0	69.0	67.0	61.0	57.0	53.0	52.0	51.0	64.0	0.0	64.0		
	9	64.5	85.4	48.5	76.0	74.0	69.0	67.0	61.0	57.0	52.0	51.0	49.0	64.5	0.0	64.5		
	10	62.9	83.3	47.2	74.0	72.0	68.0	67.0	60.0	56.0	51.0	50.0	48.0	62.9	0.0	62.9		
	11	62.0	84.3	45.3	73.0	70.0	67.0	65.0	59.0	56.0	51.0	49.0	47.0	62.0	0.0	62.0		
	12	67.4	91.6	46.1	79.0	75.0	70.0	68.0	61.0	56.0	51.0	49.0	48.0	67.4	0.0	67.4		
	13	63.5	80.2	47.5	74.0	72.0	69.0	67.0	62.0	58.0	53.0	51.0	48.0	63.5	0.0	63.5		
	14	67.1	89.1	47.7	78.0	74.0	71.0	70.0	65.0	60.0	55.0	53.0	51.0	67.1	0.0	67.1		
	15	67.3	90.4	51.6	77.0	75.0	71.0	70.0	64.0	61.0	57.0	55.0	54.0	67.3	0.0	67.3		
	16	67.9	85.0	35.3	78.0	77.0	74.0	73.0	66.0	53.0	38.0	36.0	35.0	67.9	0.0	67.9		
	17	64.9	88.1	52.7	75.0	73.0	69.0	68.0	63.0	60.0	55.0	55.0	53.0	64.9	0.0	64.9		
	18	66.6	93.6	50.1	76.0	73.0	69.0	67.0	61.0	58.0	54.0	53.0	52.0	66.6	0.0	66.6		
Evening	19	66.4	92.8	49.6	77.0	73.0	68.0	66.0	60.0	57.0	53.0	52.0	51.0	66.4	5.0	71.4		
	20	60.1	76.4	49.3	71.0	68.0	65.0	63.0	59.0	56.0	52.0	52.0	50.0	60.1	5.0	65.1		
	21	60.0	81.3	49.3	70.0	67.0	64.0	63.0	58.0	55.0	52.0	51.0	50.0	60.0	5.0	65.0		
Night	22	58.1	77.2	47.3	69.0	67.0	62.0	60.0	56.0	53.0	50.0	49.0	48.0	58.1	10.0	68.1		
	23	54.4	72.2	46.0	64.0	62.0	58.0	57.0	53.0	51.0	48.0	47.0	47.0	54.4	10.0	64.4		
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)				
Day	Min	62.0	80.2	35.3	73.0	70.0	67.0	65.0	59.0	53.0	38.0	36.0	35.0	24-Hour	Daytime	Nighttime		
	Max	67.9	93.6	52.7	79.0	77.0	74.0	73.0	66.0	61.0	57.0	55.0	54.0					
Energy Average		65.6	Average:		75.8	73.3	69.5	67.9	62.1	57.6	52.0	50.6	48.9	64.1 65.2 61.2				
Evening	Min	60.0	76.4	49.3	70.0	67.0	64.0	63.0	58.0	55.0	52.0	51.0	50.0					
	Max	66.4	92.8	49.6	77.0	73.0	68.0	66.0	60.0	57.0	53.0	52.0	51.0	24-Hour CNEL (dBA)				
Energy Average		63.3	Average:		72.7	69.3	65.7	64.0	59.0	56.0	52.3	51.7	50.3					
Night	Min	54.1	72.2	41.8	64.0	62.0	56.0	53.0	48.0	45.0	43.0	43.0	42.0	68.8				
	Max	67.1	87.6	49.2	77.0	75.0	71.0	70.0	65.0	61.0	56.0	55.0	52.0					
Energy Average		61.2	Average:		69.6	66.8	62.4	60.6	55.2	52.0	48.2	47.3	46.2					

24-Hour Noise Level Measurement Summary

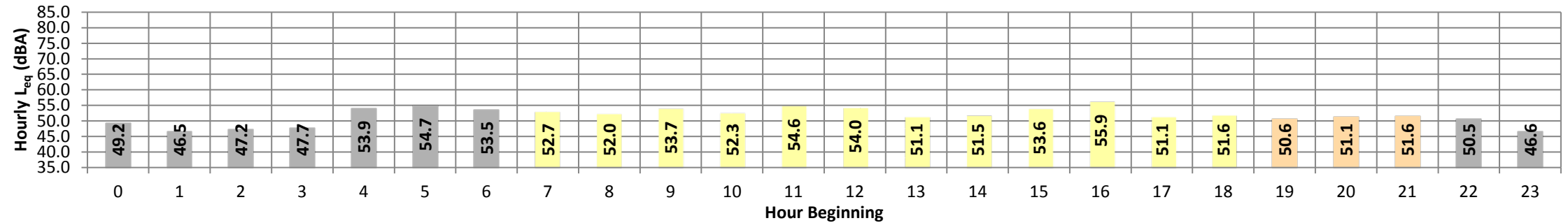
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L2 - Located at northern boundary of the Project site on Perry Street near vacant land parcels.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L _{eq}	Adj.	Adj. L _{eq}		
Night	0	49.2	63.1	44.2	54.0	53.0	51.0	51.0	49.0	48.0	46.0	46.0	45.0	49.2	10.0	59.2		
	1	46.5	59.0	41.6	51.0	50.0	49.0	48.0	47.0	45.0	44.0	43.0	42.0	46.5	10.0	56.5		
	2	47.2	69.6	41.5	57.0	53.0	48.0	48.0	46.0	44.0	42.0	42.0	42.0	47.2	10.0	57.2		
	3	47.7	66.4	42.6	54.0	52.0	50.0	49.0	47.0	46.0	44.0	44.0	43.0	47.7	10.0	57.7		
	4	53.9	85.1	44.0	57.0	55.0	52.0	51.0	49.0	47.0	45.0	45.0	44.0	53.9	10.0	63.9		
	5	54.7	80.6	43.7	66.0	60.0	55.0	53.0	49.0	47.0	45.0	45.0	44.0	54.7	10.0	64.7		
	6	53.5	77.3	45.2	61.0	57.0	55.0	54.0	51.0	49.0	47.0	46.0	46.0	53.5	10.0	63.5		
Day	7	52.7	77.7	46.2	58.0	57.0	55.0	54.0	51.0	50.0	48.0	48.0	47.0	52.7	0.0	52.7		
	8	52.0	68.9	46.9	61.0	59.0	56.0	54.0	51.0	49.0	48.0	48.0	47.0	52.0	0.0	52.0		
	9	53.7	75.6	44.6	66.0	58.0	53.0	52.0	49.0	48.0	46.0	46.0	45.0	53.7	0.0	53.7		
	10	52.3	75.8	43.7	62.0	59.0	54.0	52.0	49.0	47.0	45.0	45.0	44.0	52.3	0.0	52.3		
	11	54.6	75.8	42.6	67.0	63.0	58.0	55.0	49.0	46.0	44.0	43.0	43.0	54.6	0.0	54.6		
	12	54.0	82.7	43.2	61.0	58.0	55.0	53.0	48.0	46.0	44.0	44.0	43.0	54.0	0.0	54.0		
	13	51.1	77.5	43.6	58.0	56.0	54.0	52.0	48.0	46.0	45.0	44.0	44.0	51.1	0.0	51.1		
	14	51.5	78.3	43.1	60.0	57.0	54.0	53.0	49.0	47.0	45.0	44.0	43.0	51.5	0.0	51.5		
	15	53.6	76.4	44.0	64.0	61.0	56.0	54.0	50.0	48.0	46.0	45.0	45.0	53.6	0.0	53.6		
	16	55.9	83.7	43.6	66.0	63.0	59.0	57.0	51.0	49.0	45.0	45.0	44.0	55.9	0.0	55.9		
	17	51.1	75.1	44.4	58.0	56.0	54.0	53.0	50.0	48.0	46.0	45.0	45.0	51.1	0.0	51.1		
	18	51.6	71.4	42.9	62.0	60.0	56.0	54.0	49.0	47.0	44.0	44.0	43.0	51.6	0.0	51.6		
Evening	19	50.6	73.6	43.4	57.0	56.0	54.0	53.0	50.0	48.0	45.0	45.0	44.0	50.6	5.0	55.6		
	20	51.1	73.4	44.2	58.0	56.0	54.0	53.0	50.0	49.0	47.0	46.0	45.0	51.1	5.0	56.1		
	21	51.6	72.9	43.6	56.0	56.0	54.0	53.0	52.0	50.0	47.0	45.0	44.0	51.6	5.0	56.6		
Night	22	50.5	76.0	43.0	59.0	58.0	52.0	51.0	48.0	46.0	44.0	44.0	43.0	50.5	10.0	60.5		
	23	46.6	62.5	40.9	55.0	53.0	50.0	48.0	46.0	44.0	42.0	42.0	41.0	46.6	10.0	56.6		
Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L _{eq} (dBA)				
Day	Min	51.1	68.9	42.6	58.0	56.0	53.0	52.0	48.0	46.0	44.0	43.0	43.0	24-Hour	Daytime	Nighttime		
	Max	55.9	83.7	46.9	67.0	63.0	59.0	57.0	51.0	50.0	48.0	48.0	47.0					
Energy Average		53.1	Average:		61.9	58.9	55.3	53.6	49.5	47.6	45.5	45.1	44.4	52.2			52.8	51.1
Evening	Min	50.6	72.9	43.4	56.0	56.0	54.0	53.0	50.0	48.0	45.0	45.0	44.0					
	Max	51.6	73.6	44.2	58.0	56.0	54.0	53.0	52.0	50.0	47.0	46.0	45.0	24-Hour CNEL (dBA)				
Energy Average		51.1	Average:		57.0	56.0	54.0	53.0	50.7	49.0	46.3	45.3	44.3	58.0				
Night	Min	46.5	59.0	40.9	51.0	50.0	48.0	48.0	46.0	44.0	42.0	42.0	41.0					
	Max	54.7	85.1	45.2	66.0	60.0	55.0	54.0	51.0	49.0	47.0	46.0	46.0					
Energy Average		51.1	Average:		57.1	54.6	51.3	50.3	48.0	46.2	44.3	44.1	43.3					

24-Hour Noise Level Measurement Summary

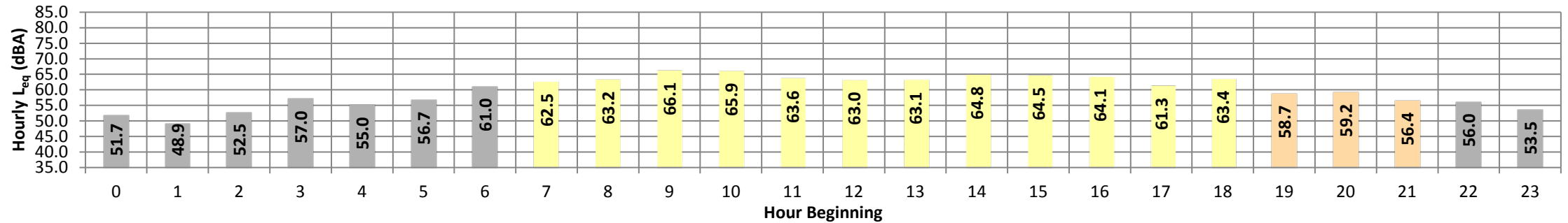
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L3 - Located east of the Project site, near the intersection of Perry Street and Harvill Avenue.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}		
Night	0	51.7	68.2	44.5	62.0	59.0	55.0	53.0	51.0	49.0	46.0	45.0	44.0	51.7	10.0	61.7		
	1	48.9	78.0	43.5	57.0	55.0	51.0	50.0	46.0	44.0	43.0	43.0	43.0	48.9	10.0	58.9		
	2	52.5	66.1	43.6	59.0	58.0	57.0	56.0	54.0	48.0	45.0	44.0	44.0	52.5	10.0	62.5		
	3	57.0	67.3	47.1	63.0	62.0	60.0	60.0	58.0	56.0	51.0	50.0	49.0	57.0	10.0	67.0		
	4	55.0	71.8	47.3	63.0	61.0	58.0	57.0	54.0	53.0	50.0	50.0	48.0	55.0	10.0	65.0		
	5	56.7	80.2	45.8	65.0	63.0	61.0	60.0	56.0	52.0	48.0	47.0	46.0	56.7	10.0	66.7		
	6	61.0	78.9	47.6	69.0	67.0	66.0	64.0	61.0	58.0	51.0	50.0	49.0	61.0	10.0	71.0		
Day	7	62.5	78.9	49.5	71.0	70.0	68.0	67.0	63.0	58.0	51.0	51.0	50.0	62.5	0.0	62.5		
	8	63.2	78.5	50.6	72.0	71.0	69.0	68.0	63.0	58.0	53.0	52.0	51.0	63.2	0.0	63.2		
	9	66.1	91.2	49.3	75.0	73.0	71.0	70.0	65.0	59.0	53.0	51.0	50.0	66.1	0.0	66.1		
	10	65.9	82.5	50.5	74.0	73.0	72.0	71.0	65.0	61.0	54.0	53.0	51.0	65.9	0.0	65.9		
	11	63.6	76.2	49.0	72.0	71.0	70.0	68.0	63.0	58.0	52.0	51.0	50.0	63.6	0.0	63.6		
	12	63.0	85.9	47.9	74.0	71.0	68.0	66.0	61.0	56.0	51.0	50.0	49.0	63.0	0.0	63.0		
	13	63.1	82.5	47.4	73.0	71.0	68.0	67.0	62.0	57.0	51.0	50.0	49.0	63.1	0.0	63.1		
	14	64.8	90.7	46.3	74.0	71.0	69.0	68.0	64.0	60.0	51.0	49.0	47.0	64.8	0.0	64.8		
	15	64.5	82.8	49.2	73.0	71.0	69.0	68.0	65.0	61.0	52.0	51.0	50.0	64.5	0.0	64.5		
	16	64.1	85.2	49.8	73.0	71.0	68.0	67.0	63.0	59.0	52.0	51.0	50.0	64.1	0.0	64.1		
	17	61.3	75.9	49.2	70.0	69.0	67.0	66.0	61.0	56.0	51.0	50.0	49.0	61.3	0.0	61.3		
	18	63.4	90.4	48.1	70.0	69.0	66.0	65.0	60.0	55.0	51.0	50.0	49.0	63.4	0.0	63.4		
Evening	19	58.7	77.4	47.8	68.0	66.0	64.0	62.0	57.0	54.0	50.0	49.0	48.0	58.7	5.0	63.7		
	20	59.2	84.7	48.4	67.0	66.0	63.0	62.0	58.0	55.0	52.0	51.0	50.0	59.2	5.0	64.2		
	21	56.4	71.3	47.5	65.0	64.0	61.0	60.0	55.0	53.0	50.0	50.0	48.0	56.4	5.0	61.4		
Night	22	56.0	79.1	46.6	66.0	63.0	60.0	58.0	53.0	51.0	49.0	48.0	47.0	56.0	10.0	66.0		
	23	53.5	74.3	44.6	65.0	62.0	58.0	55.0	51.0	49.0	46.0	46.0	45.0	53.5	10.0	63.5		
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)				
Day	Min	61.3	75.9	46.3	70.0	69.0	66.0	65.0	60.0	55.0	51.0	49.0	47.0	24-Hour	Daytime	Nighttime		
	Max	66.1	91.2	50.6	75.0	73.0	72.0	71.0	65.0	61.0	54.0	53.0	51.0					
Energy Average		64.0	Average:		72.6	70.9	68.8	67.6	62.9	58.2	51.8	50.8	49.6	24-Hour CNEL (dBA)				
Evening	Min	56.4	71.3	47.5	65.0	64.0	61.0	60.0	55.0	53.0	50.0	49.0	48.0					
	Max	59.2	84.7	48.4	68.0	66.0	64.0	62.0	58.0	55.0	52.0	51.0	50.0	24-Hour CNEL (dBA)				
Energy Average		58.3	Average:		66.7	65.3	62.7	61.3	56.7	54.0	50.7	50.0	48.7					
Night	Min	48.9	66.1	43.5	57.0	55.0	51.0	50.0	46.0	44.0	43.0	43.0	43.0	24-Hour CNEL (dBA)				
	Max	61.0	80.2	47.6	69.0	67.0	66.0	64.0	61.0	58.0	51.0	50.0	49.0					
Energy Average		56.0	Average:		63.2	61.1	58.4	57.0	53.8	51.1	47.7	47.0	46.1	64.8				

24-Hour Noise Level Measurement Summary

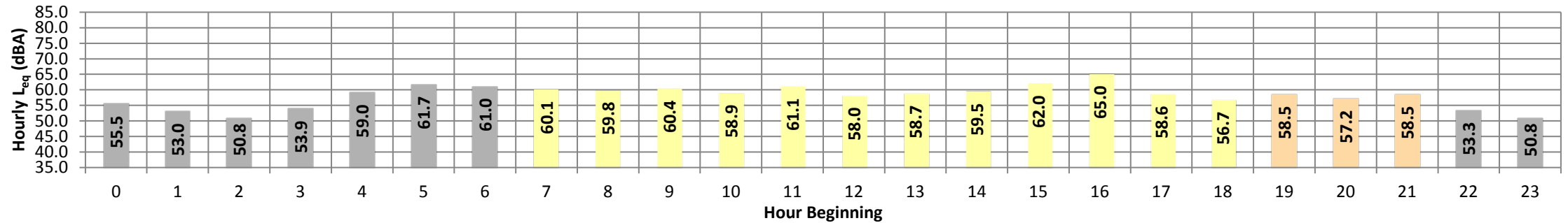
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L4 - Located south of the Project site, on Martin Street near
White House Sanitation.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}					
Night	0	55.5	76.3	47.2	61.0	59.0	58.0	57.0	55.0	54.0	51.0	50.0	49.0	55.5	10.0	65.5					
	1	53.0	76.7	44.5	61.0	57.0	54.0	54.0	51.0	50.0	47.0	46.0	45.0	53.0	10.0	63.0					
	2	50.8	70.4	42.6	61.0	57.0	53.0	52.0	50.0	48.0	45.0	45.0	43.0	50.8	10.0	60.8					
	3	53.9	71.9	45.2	66.0	62.0	55.0	54.0	52.0	50.0	48.0	48.0	46.0	53.9	10.0	63.9					
	4	59.0	81.4	47.3	70.0	68.0	64.0	60.0	53.0	51.0	49.0	48.0	48.0	59.0	10.0	69.0					
	5	61.7	84.6	46.2	72.0	70.0	68.0	66.0	56.0	51.0	48.0	47.0	47.0	61.7	10.0	71.7					
	6	61.0	80.6	46.2	72.0	70.0	67.0	66.0	57.0	52.0	48.0	48.0	47.0	61.0	10.0	71.0					
Day	7	60.1	78.3	48.7	70.0	69.0	66.0	64.0	57.0	54.0	51.0	50.0	49.0	60.1	0.0	60.1					
	8	59.8	77.5	49.8	71.0	69.0	66.0	63.0	56.0	53.0	52.0	51.0	50.0	59.8	0.0	59.8					
	9	60.4	80.3	47.5	72.0	70.0	65.0	63.0	54.0	52.0	49.0	48.0	48.0	60.4	0.0	60.4					
	10	58.9	81.4	45.4	70.0	67.0	64.0	62.0	54.0	50.0	48.0	47.0	46.0	58.9	0.0	58.9					
	11	61.1	88.1	44.7	70.0	69.0	66.0	64.0	56.0	51.0	48.0	47.0	46.0	61.1	0.0	61.1					
	12	58.0	74.8	43.8	69.0	68.0	65.0	63.0	54.0	49.0	46.0	45.0	44.0	58.0	0.0	58.0					
	13	58.7	80.0	44.4	70.0	68.0	65.0	63.0	54.0	49.0	46.0	45.0	45.0	58.7	0.0	58.7					
	14	59.5	77.6	43.3	70.0	69.0	66.0	65.0	56.0	50.0	45.0	45.0	44.0	59.5	0.0	59.5					
	15	62.0	86.7	43.6	72.0	70.0	67.0	66.0	58.0	50.0	46.0	45.0	45.0	62.0	0.0	62.0					
	16	65.0	93.0	45.5	74.0	71.0	67.0	65.0	58.0	51.0	47.0	47.0	46.0	65.0	0.0	65.0					
	17	58.6	77.0	46.0	69.0	68.0	65.0	64.0	55.0	50.0	47.0	47.0	46.0	58.6	0.0	58.6					
	18	56.7	80.2	43.5	67.0	66.0	64.0	61.1	52.0	49.0	46.0	45.0	44.0	56.7	0.0	56.7					
Evening	19	58.5	78.9	45.9	68.0	66.0	64.0	61.0	55.0	53.0	50.0	49.0	47.0	58.5	5.0	63.5					
	20	57.2	75.5	49.1	67.0	65.0	61.0	59.0	55.0	54.0	51.0	51.0	50.0	57.2	5.0	62.2					
	21	58.5	77.4	47.0	69.0	66.0	63.0	61.0	57.0	55.0	50.0	49.0	48.0	58.5	5.0	63.5					
Night	22	53.3	74.1	43.6	64.0	62.0	57.0	55.0	51.0	49.0	46.0	46.0	45.0	53.3	10.0	63.3					
	23	50.8	73.1	39.5	61.0	58.0	51.0	50.0	47.0	45.0	43.0	42.0	41.0	50.8	10.0	60.8					
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)							
Day	Min	56.7	74.8	43.3	67.0	66.0	64.0	61.1	52.0	49.0	45.0	45.0	44.0	24-Hour	Daytime	Nighttime					
	Max	65.0	93.0	49.8	74.0	71.0	67.0	66.0	58.0	54.0	52.0	51.0	50.0								
Energy Average		60.5	Average:		70.3	68.7	65.5	63.6	55.3	50.7	47.6	46.8	46.1	59.2			60.1		57.3		
Evening	Min	57.2	75.5	45.9	67.0	65.0	61.0	59.0	55.0	53.0	50.0	49.0	47.0								
	Max	58.5	78.9	49.1	69.0	66.0	64.0	61.0	57.0	55.0	51.0	51.0	50.0	24-Hour CNEL (dBA)			64.5				
Energy Average		58.1	Average:		68.0	65.7	62.7	60.3	55.7	54.0	50.3	49.7	48.3								
Night	Min	50.8	70.4	39.5	61.0	57.0	51.0	50.0	47.0	45.0	43.0	42.0	41.0	24-Hour CNEL (dBA)			64.5				
	Max	61.7	84.6	47.3	72.0	70.0	68.0	66.0	57.0	54.0	51.0	50.0	49.0								
Energy Average		57.3	Average:		65.3	62.6	58.6	57.1	52.4	50.0	47.2	46.7	45.7								

24-Hour Noise Level Measurement Summary

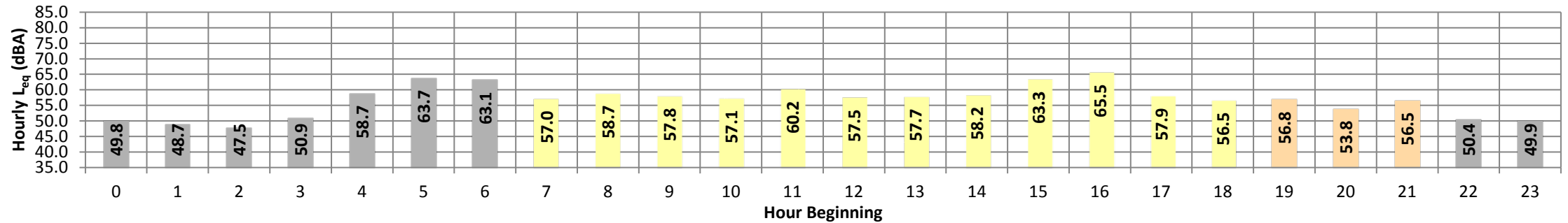
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L5 - Located south of the Project site, on Seaton Avenue, near existing single-family residential homes.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}		
Night	0	49.8	64.2	43.7	57.0	56.0	54.0	53.0	49.0	47.0	45.0	45.0	44.0	49.8	10.0	59.8		
	1	48.7	74.5	41.0	56.0	53.0	50.0	49.0	47.0	45.0	43.0	42.0	41.0	48.7	10.0	58.7		
	2	47.5	66.9	41.1	57.0	54.0	50.0	48.0	46.0	44.0	42.0	42.0	41.0	47.5	10.0	57.5		
	3	50.9	74.4	42.0	62.0	59.0	53.0	51.0	47.0	45.0	44.0	43.0	42.0	50.9	10.0	60.9		
	4	58.7	84.4	44.1	69.0	65.0	60.0	57.0	50.0	47.0	45.0	45.0	44.0	58.7	10.0	68.7		
	5	63.7	89.2	43.0	75.0	72.0	66.0	63.0	55.0	50.0	45.0	44.0	43.0	63.7	10.0	73.7		
	6	63.1	93.7	43.1	72.0	68.0	63.0	60.0	55.0	50.0	45.0	45.0	44.0	63.1	10.0	73.1		
Day	7	57.0	79.7	44.7	67.0	65.0	60.0	58.0	53.0	50.0	46.0	46.0	45.0	57.0	0.0	57.0		
	8	58.7	80.6	45.5	69.0	65.0	62.0	61.0	54.0	50.0	48.0	47.0	46.0	58.7	0.0	58.7		
	9	57.8	88.2	43.2	66.0	64.0	60.0	58.0	52.0	50.0	46.0	45.0	44.0	57.8	0.0	57.8		
	10	57.1	86.5	42.3	65.0	63.0	59.0	56.0	51.0	47.0	44.0	43.0	43.0	57.1	0.0	57.1		
	11	60.2	86.8	40.9	70.0	67.0	63.0	60.0	54.0	48.0	44.0	43.0	42.0	60.2	0.0	60.2		
	12	57.5	82.8	41.1	68.0	65.0	62.0	60.0	53.0	49.0	45.0	44.0	42.0	57.5	0.0	57.5		
	13	57.7	78.9	42.2	68.0	66.0	63.0	61.0	55.0	50.0	45.0	44.0	43.0	57.7	0.0	57.7		
	14	58.2	80.6	42.1	69.0	67.0	63.0	61.0	55.0	50.0	44.0	44.0	43.0	58.2	0.0	58.2		
	15	63.3	91.7	42.2	74.0	71.0	67.0	64.0	57.0	52.0	45.0	44.0	43.0	63.3	0.0	63.3		
	16	65.5	92.7	43.6	73.0	70.0	65.0	63.0	57.0	52.0	46.0	45.0	44.0	65.5	0.0	65.5		
	17	57.9	84.3	44.6	67.0	65.0	61.0	59.0	53.0	50.0	46.0	46.0	45.0	57.9	0.0	57.9		
	18	56.5	88.4	43.2	64.0	62.0	59.0	57.0	51.0	48.0	44.0	44.0	43.0	56.5	0.0	56.5		
Evening	19	56.8	83.7	43.9	64.0	61.0	57.0	56.0	51.0	49.0	46.0	46.0	44.0	56.8	5.0	61.8		
	20	53.8	79.1	45.9	63.0	60.0	56.0	54.0	51.0	49.0	47.0	47.0	46.0	53.8	5.0	58.8		
	21	56.5	83.6	44.7	66.0	62.0	58.0	56.0	52.0	50.0	47.0	46.0	45.0	56.5	5.0	61.5		
Night	22	50.4	70.4	44.1	60.0	57.0	54.0	53.0	49.0	47.0	45.0	45.0	44.0	50.4	10.0	60.4		
	23	49.9	75.8	40.5	57.0	55.0	52.0	51.0	47.0	45.0	43.0	43.0	42.0	49.9	10.0	59.9		
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)				
Day	Min	56.5	78.9	40.9	64.0	62.0	59.0	56.0	51.0	47.0	44.0	43.0	42.0	24-Hour	Daytime	Nighttime		
	Max	65.5	92.7	45.5	74.0	71.0	67.0	64.0	57.0	52.0	48.0	47.0	46.0					
Energy Average		60.0	Average:		68.3	65.8	62.0	59.8	53.8	49.7	45.3	44.6	43.6	24-Hour CNEL (dBA)				
Evening	Min	53.8	79.1	43.9	63.0	60.0	56.0	54.0	51.0	49.0	46.0	46.0	44.0					
	Max	56.8	83.7	45.9	66.0	62.0	58.0	56.0	52.0	50.0	47.0	47.0	46.0	24-Hour CNEL (dBA)				
Energy Average		55.9	Average:		64.3	61.0	57.0	55.3	51.3	49.3	46.7	46.3	45.0					
Night	Min	47.5	64.2	40.5	56.0	53.0	50.0	48.0	46.0	44.0	42.0	42.0	41.0	24-Hour CNEL (dBA)				
	Max	63.7	93.7	44.1	75.0	72.0	66.0	63.0	55.0	50.0	45.0	45.0	44.0					
Energy Average		58.0	Average:		62.8	59.9	55.8	53.9	49.4	46.7	44.1	43.8	42.8	64.8				

24-Hour Noise Level Measurement Summary

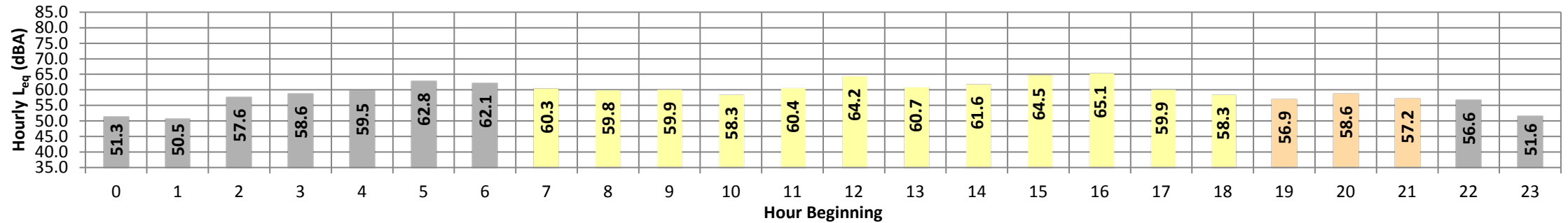
Date: Tuesday, November 06, 2018
Project: Seaton Commercial Center

Location: L6 - Located adjacent to the Project site near existing industrial and residential uses across Seaton Avenue.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}		
Night	0	51.3	75.6	43.6	59.0	56.0	52.0	51.0	49.0	47.0	45.0	45.0	44.0	51.3	10.0	61.3		
	1	50.5	74.9	41.8	59.0	56.0	50.0	48.0	46.0	45.0	43.0	43.0	42.0	50.5	10.0	60.5		
	2	57.6	83.9	40.9	67.0	60.0	52.0	48.0	45.0	44.0	43.0	43.0	42.0	57.6	10.0	67.6		
	3	58.6	87.1	44.4	71.0	66.0	56.0	52.0	47.0	46.0	45.0	45.0	44.0	58.6	10.0	68.6		
	4	59.5	81.9	44.0	73.0	70.0	64.0	59.0	50.0	47.0	45.0	45.0	44.0	59.5	10.0	69.5		
	5	62.8	85.2	43.0	75.0	72.0	68.0	64.0	52.0	47.0	45.0	44.0	43.0	62.8	10.0	72.8		
	6	62.1	83.5	44.4	74.0	72.0	68.0	65.0	56.0	51.0	47.0	46.0	45.0	62.1	10.0	72.1		
Day	7	60.3	80.3	47.0	73.0	71.0	66.0	62.0	54.0	51.0	48.0	48.0	48.0	60.3	0.0	60.3		
	8	59.8	80.1	48.4	72.0	70.0	64.0	61.0	54.0	51.0	49.0	49.0	49.0	59.8	0.0	59.8		
	9	59.9	80.8	45.7	73.0	70.0	65.0	61.0	52.0	50.0	47.0	47.0	46.0	59.9	0.0	59.9		
	10	58.3	76.9	45.2	71.0	69.0	64.0	60.0	51.0	48.0	46.0	46.0	45.0	58.3	0.0	58.3		
	11	60.4	81.7	44.2	73.0	71.0	66.0	62.0	54.0	49.0	45.0	45.0	44.0	60.4	0.0	60.4		
	12	64.2	90.4	45.2	76.0	72.0	69.0	66.0	54.0	49.0	46.0	46.0	46.0	64.2	0.0	64.2		
	13	60.7	82.7	45.6	72.0	70.0	67.0	64.0	55.0	50.0	47.0	47.0	46.0	60.7	0.0	60.7		
	14	61.6	83.0	46.0	73.0	71.0	68.0	65.0	56.0	51.0	48.0	47.0	46.0	61.6	0.0	61.6		
	15	64.5	87.0	46.9	75.0	72.0	69.0	67.0	60.0	54.0	49.0	49.0	48.0	64.5	0.0	64.5		
	16	65.1	90.5	47.3	76.0	73.0	70.0	67.0	58.0	52.0	49.0	49.0	48.0	65.1	0.0	65.1		
	17	59.9	81.4	47.1	72.0	70.0	66.0	62.0	54.0	51.0	48.0	48.0	47.0	59.9	0.0	59.9		
	18	58.3	80.0	45.9	71.0	68.0	63.0	60.0	53.0	50.0	47.0	47.0	46.0	58.3	0.0	58.3		
Evening	19	56.9	79.3	45.9	70.0	66.0	59.0	57.0	52.0	50.0	48.0	47.0	46.0	56.9	5.0	61.9		
	20	58.6	85.0	47.1	71.0	68.0	60.0	57.0	53.0	51.0	48.0	48.0	47.0	58.6	5.0	63.6		
	21	57.2	79.4	46.1	70.0	66.0	60.0	57.0	53.0	52.0	49.0	49.0	47.0	57.2	5.0	62.2		
Night	22	56.6	80.0	45.6	69.0	65.0	58.0	55.0	51.0	49.0	47.0	47.0	46.0	56.6	10.0	66.6		
	23	51.6	73.9	43.1	61.0	58.0	54.0	51.0	48.0	47.0	45.0	45.0	44.0	51.6	10.0	61.6		
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)				
Day	Min	58.3	76.9	44.2	71.0	68.0	63.0	60.0	51.0	48.0	45.0	45.0	44.0	24-Hour	Daytime	Nighttime		
	Max	65.1	90.5	48.4	76.0	73.0	70.0	67.0	60.0	54.0	49.0	49.0	49.0					
Energy Average		61.7	Average:		73.1	70.6	66.4	63.1	54.6	50.5	47.4	47.3	46.6	60.461.158.6				
Evening	Min	56.9	79.3	45.9	70.0	66.0	59.0	57.0	52.0	50.0	48.0	47.0	46.0					
	Max	58.6	85.0	47.1	71.0	68.0	60.0	57.0	53.0	52.0	49.0	49.0	47.0	24-Hour CNEL (dBA)65.7				
Energy Average		57.6	Average:		70.3	66.7	59.7	57.0	52.7	51.0	48.3	48.0	46.7					
Night	Min	50.5	73.9	40.9	59.0	56.0	50.0	48.0	45.0	44.0	43.0	43.0	42.0					
	Max	62.8	87.1	45.6	75.0	72.0	68.0	65.0	56.0	51.0	47.0	47.0	46.0					
Energy Average		58.6	Average:		67.6	63.9	58.0	54.8	49.3	47.0	45.0	44.8	43.8					

24-Hour Noise Level Measurement Summary

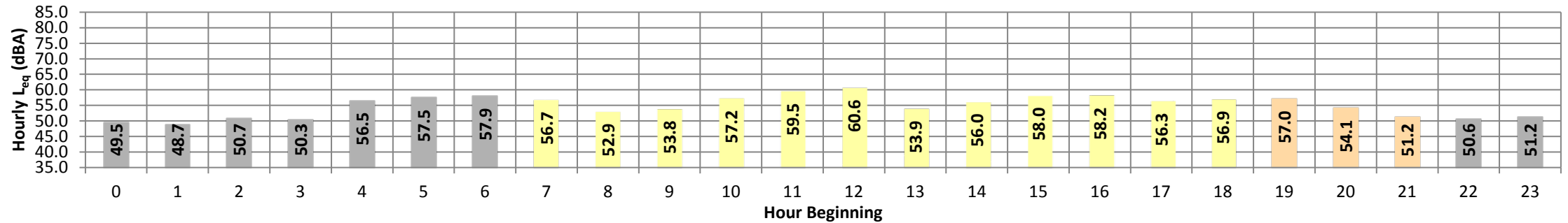
Date: Tuesday, December 11, 2018
Project: Seaton Commercial Center

Location: L7 - Located north of the Project site on Seaton Avenue
adjacent to existing residential homes.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}		
Night	0	49.5	74.1	42.6	58.0	54.0	51.0	50.0	48.0	46.0	45.0	44.0	43.0	49.5	10.0	59.5		
	1	48.7	68.9	42.0	55.0	53.0	51.0	51.0	48.0	47.0	44.0	44.0	43.0	48.7	10.0	58.7		
	2	50.7	73.7	43.7	57.0	54.0	51.0	50.0	48.0	47.0	45.0	45.0	44.0	50.7	10.0	60.7		
	3	50.3	70.8	43.4	58.0	55.0	52.0	51.0	49.0	48.0	46.0	46.0	45.0	50.3	10.0	60.3		
	4	56.5	81.4	46.3	66.0	63.0	59.0	57.0	53.0	51.0	48.0	48.0	47.0	56.5	10.0	66.5		
	5	57.5	77.9	48.9	64.0	62.0	60.0	59.0	57.0	56.0	51.0	51.0	50.0	57.5	10.0	67.5		
	6	57.9	74.8	50.6	66.0	64.0	62.0	60.0	57.0	55.0	53.0	52.0	51.0	57.9	10.0	67.9		
Day	7	56.7	78.9	48.8	67.0	64.0	60.0	58.0	55.0	53.0	50.0	49.0	49.0	56.7	0.0	56.7		
	8	52.9	73.6	44.5	63.0	61.0	57.0	55.0	50.0	49.0	46.0	46.0	45.0	52.9	0.0	52.9		
	9	53.8	76.5	44.2	65.0	62.0	58.0	55.0	49.0	47.0	45.0	45.0	45.0	53.8	0.0	53.8		
	10	57.2	76.8	45.4	70.0	67.0	61.0	59.0	52.0	49.0	47.0	46.0	46.0	57.2	0.0	57.2		
	11	59.5	85.1	43.8	70.0	64.0	58.0	56.0	50.0	47.0	45.0	45.0	45.0	59.5	0.0	59.5		
	12	60.6	83.0	44.4	73.0	69.0	62.0	58.1	51.0	48.0	46.0	46.0	45.0	60.6	0.0	60.6		
	13	53.9	74.7	47.4	62.0	60.0	57.0	55.0	52.0	51.0	49.0	49.0	48.0	53.9	0.0	53.9		
	14	56.0	78.5	46.5	66.0	63.0	60.0	58.0	53.0	51.0	49.0	48.0	47.0	56.0	0.0	56.0		
	15	58.0	82.8	48.3	68.0	65.0	61.0	59.0	55.0	53.0	50.0	50.0	49.0	58.0	0.0	58.0		
	16	58.2	84.3	49.2	68.0	64.0	61.0	59.0	55.0	53.0	51.0	50.0	50.0	58.2	0.0	58.2		
	17	56.3	77.3	50.0	64.0	62.0	59.0	58.0	56.0	54.0	52.0	51.0	51.0	56.3	0.0	56.3		
	18	56.9	78.7	49.9	64.0	62.0	60.0	58.0	56.0	55.0	52.0	51.0	51.0	56.9	0.0	56.9		
Evening	19	57.0	82.4	47.9	68.0	65.0	59.0	57.0	53.0	51.0	50.0	49.0	48.0	57.0	5.0	62.0		
	20	54.1	76.3	46.5	63.0	60.0	57.0	55.0	52.0	51.0	48.0	48.0	47.0	54.1	5.0	59.1		
	21	51.2	71.2	44.3	60.0	58.0	54.0	53.0	50.0	48.0	46.0	46.0	45.0	51.2	5.0	56.2		
Night	22	50.6	65.6	44.3	57.0	56.0	53.0	53.0	51.0	49.0	46.0	45.0	45.0	50.6	10.0	60.6		
	23	51.2	76.0	43.8	58.0	55.0	53.0	53.0	51.0	49.0	46.0	45.0	44.0	51.2	10.0	61.2		
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq} (dBA)				
Day	Min	52.9	73.6	43.8	62.0	60.0	57.0	55.0	49.0	47.0	45.0	45.0	45.0	24-Hour	Daytime	Nighttime		
	Max	60.6	85.1	50.0	73.0	69.0	62.0	59.0	56.0	55.0	52.0	51.0	51.0					
Energy Average		57.2	Average:		66.7	63.6	59.5	57.3	52.8	50.8	48.5	48.0	47.6	56.0			56.8	54.0
Evening	Min	51.2	71.2	44.3	60.0	58.0	54.0	53.0	50.0	48.0	46.0	46.0	45.0					
	Max	57.0	82.4	47.9	68.0	65.0	59.0	57.0	53.0	51.0	50.0	49.0	48.0	24-Hour CNEL (dBA)				
Energy Average		54.7	Average:		63.7	61.0	56.7	55.0	51.7	50.0	48.0	47.7	46.7	61.2				
Night	Min	48.7	65.6	42.0	55.0	53.0	51.0	50.0	48.0	46.0	44.0	44.0	43.0					
	Max	57.9	81.4	50.6	66.0	64.0	62.0	60.0	57.0	56.0	53.0	52.0	51.0					
Energy Average		54.0	Average:		59.9	57.3	54.7	53.8	51.3	49.8	47.1	46.7	45.8					

24-Hour Noise Level Measurement Summary

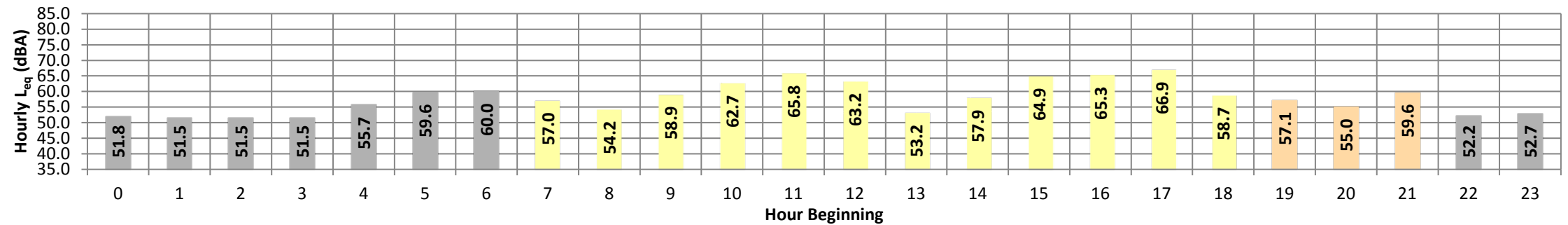
Date: Tuesday, December 11, 2018
Project: Seaton Commercial Center

Location: L8 - Located adjacent to the Project's western site boundary on Seaton Avenue near existing residences and industrial uses.

Meter: Piccolo I

JN: 11633
Analyst: R. Saber

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L _{eq}	Adj.	Adj. L _{eq}		
Night	0	51.8	77.9	45.7	56.0	55.0	53.0	52.0	50.0	49.0	47.0	47.0	46.0	51.8	10.0	61.8		
	1	51.5	62.9	45.4	58.0	56.0	55.0	54.0	52.0	50.0	48.0	47.0	46.0	51.5	10.0	61.5		
	2	51.5	71.3	45.4	59.0	55.0	53.0	51.0	50.0	49.0	47.0	47.0	46.0	51.5	10.0	61.5		
	3	51.5	69.0	46.5	59.0	57.0	54.0	53.0	51.0	49.0	48.0	48.0	47.0	51.5	10.0	61.5		
	4	55.7	75.0	49.9	64.0	61.0	58.0	57.0	54.0	53.0	51.0	51.0	50.0	55.7	10.0	65.7		
	5	59.6	75.6	51.6	64.0	63.0	62.0	61.0	60.0	58.0	54.0	53.0	53.0	59.6	10.0	69.6		
	6	60.0	85.7	52.4	67.0	65.0	62.0	61.0	59.0	57.0	54.0	53.0	53.0	60.0	10.0	70.0		
Day	7	57.0	72.1	48.9	65.0	63.0	61.0	59.0	57.0	56.0	50.0	50.0	49.0	57.0	0.0	57.0		
	8	54.2	76.7	43.0	65.0	63.0	59.0	56.0	51.0	49.0	45.0	45.0	44.0	54.2	0.0	54.2		
	9	58.9	80.3	43.3	69.0	67.0	65.0	63.0	58.0	48.0	44.0	44.0	43.0	58.9	0.0	58.9		
	10	62.7	75.6	44.5	71.0	70.0	68.0	67.0	63.0	58.0	47.0	46.0	45.0	62.7	0.0	62.7		
	11	65.8	90.8	43.8	79.0	69.0	61.0	57.0	51.0	49.0	46.0	45.0	45.0	65.8	0.0	65.8		
	12	63.2	87.2	44.1	76.0	70.0	62.0	59.0	51.0	49.0	46.0	45.0	44.0	63.2	0.0	63.2		
	13	53.2	70.9	47.1	63.0	60.0	56.0	55.0	52.0	50.0	49.0	48.0	48.0	53.2	0.0	53.2		
	14	57.9	85.6	45.3	67.0	64.0	60.0	59.0	55.0	52.0	48.0	47.0	46.0	57.9	0.0	57.9		
	15	64.9	88.6	49.9	78.0	71.0	65.0	62.0	57.0	54.0	51.0	51.0	50.0	64.9	0.0	64.9		
	16	65.3	87.9	51.7	79.0	75.0	67.0	62.0	57.0	55.0	53.0	53.0	52.0	65.3	0.0	65.3		
	17	66.9	88.9	51.8	81.0	78.0	70.0	63.0	57.0	55.0	53.0	53.0	52.0	66.9	0.0	66.9		
	18	58.7	80.6	53.7	67.0	63.0	60.0	60.0	58.0	57.0	55.0	55.0	54.0	58.7	0.0	58.7		
Evening	19	57.1	72.1	50.9	67.0	64.0	61.0	58.0	55.0	54.0	53.0	52.0	51.0	57.1	5.0	62.1		
	20	55.0	73.2	48.7	62.0	59.0	57.0	56.0	54.0	53.0	51.0	50.0	49.0	55.0	5.0	60.0		
	21	59.6	87.5	45.3	71.0	59.0	55.0	54.0	52.0	50.0	48.0	47.0	46.0	59.6	5.0	64.6		
Night	22	52.2	69.1	46.0	57.0	56.0	55.0	54.0	53.0	51.0	48.0	48.0	47.0	52.2	10.0	62.2		
	23	52.7	71.3	45.7	59.0	57.0	56.0	55.0	53.0	51.0	47.0	47.0	46.0	52.7	10.0	62.7		
Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L _{eq} (dBA)				
Day	Min	53.2	70.9	43.0	63.0	60.0	56.0	55.0	51.0	48.0	44.0	44.0	43.0	24-Hour	Daytime	Nighttime		
	Max	66.9	90.8	53.7	81.0	78.0	70.0	67.0	63.0	58.0	55.0	55.0	54.0					
Energy Average		62.7	Average:		71.7	67.8	62.8	60.2	55.6	52.7	48.9	48.5	47.7	60.5 62.0 55.5				
Evening	Min	55.0	72.1	45.3	62.0	59.0	55.0	54.0	52.0	50.0	48.0	47.0	46.0	24-Hour CNEL (dBA)				
	Max	59.6	87.5	50.9	71.0	64.0	61.0	58.0	55.0	54.0	53.0	52.0	51.0					
Energy Average		57.6	Average:		66.7	60.7	57.7	56.0	53.7	52.3	50.7	49.7	48.7	64.0				
Night	Min	51.5	62.9	45.4	56.0	55.0	53.0	51.0	50.0	49.0	47.0	47.0	46.0					
	Max	60.0	85.7	52.4	67.0	65.0	62.0	61.0	60.0	58.0	54.0	53.0	53.0					
Energy Average		55.5	Average:		60.3	58.3	56.4	55.3	53.6	51.9	49.3	49.0	48.2					

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Seaton Av.
 Road Segment: n/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	1,981 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	198 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-9.07	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.42	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.77	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.6	54.5	53.2	47.2	55.6	56.3
Medium Trucks:	57.4	53.5	46.0	54.8	61.0	61.0
Heavy Trucks:	62.4	58.3	54.9	59.6	65.8	65.9
Vehicle Noise:	64.4	60.8	57.5	61.0	67.3	67.4

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	154	331
CNEL:	34	73	157	337

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	1,866 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	187 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph	Vehicle Mix					
Near/Far Lane Distance:	36 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
		Autos: 75.5% 14.0% 10.5% 84.94%					
		Medium Trucks: 48.9% 2.2% 48.9% 7.83%					
		Heavy Trucks: 47.3% 5.4% 47.3% 7.23%					
		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: 46.915					
		Medium Trucks: 46.726					
		Heavy Trucks: 46.744					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-9.33	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.68	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.03	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	54.3	53.0	47.0	55.4	56.0
Medium Trucks:	57.2	53.3	45.8	54.5	60.7	60.7
Heavy Trucks:	62.1	58.1	54.7	59.3	65.5	65.6
Vehicle Noise:	64.1	60.5	57.2	60.7	67.1	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	148	318
CNEL:	32	70	150	324

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS								
Highway Data		Site Conditions (Hard = 10, Soft = 15)								
Average Daily Traffic (Adt):	14,639 vehicles	Autos:					15			
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):					15			
Peak Hour Volume:	1,464 vehicles	Heavy Trucks (3+ Axles):					15			
Vehicle Speed:	45 mph	Vehicle Mix								
Near/Far Lane Distance:	36 feet									
		VehicleType	Day	Evening	Night	Daily				
Site Data		Autos:					75.5%	14.0%	10.5%	84.94%
		Medium Trucks:					48.9%	2.2%	48.9%	7.83%
		Heavy Trucks:					47.3%	5.4%	47.3%	7.23%
		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:					46.915			
		Medium Trucks:					46.726			
		Heavy Trucks:					46.744			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.89	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.24	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.59	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.7	63.4	57.4	65.8	66.4
Medium Trucks:	67.3	63.4	55.9	64.7	70.9	70.9
Heavy Trucks:	71.8	67.8	64.3	69.0	75.2	75.3
Vehicle Noise:	74.0	70.5	67.2	70.6	76.9	77.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	144	311	670	1,445
CNEL:	147	317	683	1,472

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	15,198 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,520 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.73	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.08	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.43	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.8	63.5	57.5	65.9	66.6
Medium Trucks:	67.5	63.6	56.1	64.9	71.0	71.1
Heavy Trucks:	72.0	67.9	64.5	69.2	75.4	75.5
Vehicle Noise:	74.2	70.6	67.4	70.7	77.1	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	319	687	1,481
CNEL:	151	325	701	1,510

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Perry St.
 Road Segment: w/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	140 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	14 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.58	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.0	43.0	41.7	35.7	44.1	44.8
Medium Trucks:	45.9	42.0	34.5	43.3	49.4	49.5
Heavy Trucks:	50.8	46.8	43.4	48.1	54.3	54.3
Vehicle Noise:	52.8	49.2	46.0	49.5	55.8	55.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	57
CNEL:	6	12	27	58

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	140 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	14 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data		Vehicle Mix					
		VehicleType	Day	Evening	Night	Daily	
		Autos:	75.5%	14.0%	10.5%	84.94%	
		Medium Trucks:	48.9%	2.2%	48.9%	7.83%	
		Heavy Trucks:	47.3%	5.4%	47.3%	7.23%	
		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:	46.915				
		Medium Trucks:	46.726				
		Heavy Trucks:	46.744				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.58	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.0	43.0	41.7	35.7	44.1	44.8
Medium Trucks:	45.9	42.0	34.5	43.3	49.4	49.5
Heavy Trucks:	50.8	46.8	43.4	48.1	54.3	54.3
Vehicle Noise:	52.8	49.2	46.0	49.5	55.8	55.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	57
CNEL:	6	12	27	58

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	140 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	14 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.58	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.0	43.0	41.7	35.7	44.1	44.8
Medium Trucks:	45.9	42.0	34.5	43.3	49.4	49.5
Heavy Trucks:	50.8	46.8	43.4	48.1	54.3	54.3
Vehicle Noise:	52.8	49.2	46.0	49.5	55.8	55.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	12	26	57
CNEL:	6	12	27	58

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Seaton Av.
 Road Segment: n/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,028 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	203 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.95	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.42	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.77	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.7	53.4	47.3	55.8	56.4
Medium Trucks:	57.4	53.5	46.0	54.8	61.0	61.0
Heavy Trucks:	62.4	58.3	54.9	59.6	65.8	65.9
Vehicle Noise:	64.4	60.8	57.5	61.0	67.3	67.4

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	154	331
CNEL:	34	73	157	338

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	1,929 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	193 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-9.16	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.68	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.03	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	54.5	53.1	47.1	55.6	56.2
Medium Trucks:	57.2	53.3	45.8	54.5	60.7	60.7
Heavy Trucks:	62.1	58.1	54.7	59.3	65.5	65.6
Vehicle Noise:	64.1	60.5	57.3	60.7	67.1	67.2

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	148	319
CNEL:	32	70	151	325

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	14,648 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,465 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.89	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.24	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.59	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.7	64.7	63.4	57.4	65.8	66.4
Medium Trucks:	67.3	63.4	55.9	64.7	70.9	70.9
Heavy Trucks:	71.8	67.8	64.3	69.0	75.2	75.3
Vehicle Noise:	74.0	70.5	67.2	70.6	76.9	77.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	144	311	671	1,445
CNEL:	147	317	683	1,472

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	15,236 vehicles	Autos: 15				
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,524 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph					
Near/Far Lane Distance:	36 feet					
Site Data		Vehicle Mix				
		VehicleType	Day	Evening	Night	Daily
		Autos:	75.5%	14.0%	10.5%	84.98%
		Medium Trucks:	48.9%	2.2%	48.9%	7.81%
		Heavy Trucks:	47.3%	5.4%	47.3%	7.21%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment: 0.0		
		Lane Equivalent Distance (in feet)				
		Autos:	46.915			
		Medium Trucks:	46.726			
		Heavy Trucks:	46.744			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.72	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.08	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.43	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	64.8	63.5	57.5	65.9	66.6
Medium Trucks:	67.5	63.6	56.1	64.9	71.0	71.1
Heavy Trucks:	72.0	67.9	64.5	69.2	75.4	75.5
Vehicle Noise:	74.2	70.6	67.4	70.7	77.1	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	319	688	1,481
CNEL:	151	325	701	1,510

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Perry St.
 Road Segment: w/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	250 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	25 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-17.72	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.9	45.9	44.6	38.6	47.0	47.6
Medium Trucks:	45.9	42.0	34.5	43.3	49.4	49.5
Heavy Trucks:	50.8	46.8	43.4	48.1	54.3	54.3
Vehicle Noise:	53.5	50.1	47.3	49.7	56.1	56.2

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	59
CNEL:	6	13	28	60

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	219 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	22 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-18.37	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.3	45.2	43.9	37.9	46.3	47.0
Medium Trucks:	45.9	42.0	34.5	43.3	49.4	49.5
Heavy Trucks:	50.8	46.8	43.4	48.1	54.3	54.3
Vehicle Noise:	53.3	49.9	46.9	49.6	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	28	60

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing With Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	463 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	46 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-16.22	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-25.42	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.32	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.4	47.4	46.1	40.1	48.5	49.1
Medium Trucks:	51.4	47.5	40.0	48.8	55.0	55.0
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	61.6	57.7	54.3	58.6	64.8	64.9

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	225
CNEL:	23	49	106	229

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
 Road Name: Seaton Av.
 Road Segment: n/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,061 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	206 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph	Vehicle Mix					
Near/Far Lane Distance:	36 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
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		Autos:	75.5%	14.0%	10.5%	84.94%	
		Medium Trucks:	48.9%	2.2%	48.9%	7.83%	
		Heavy Trucks:	47.3%	5.4%	47.3%	7.23%	
		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:	46.915				
Medium Trucks:	46.726						
Heavy Trucks:	46.744						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.89	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.25	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.59	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.7	53.4	47.4	55.8	56.4
Medium Trucks:	57.6	53.7	46.2	55.0	61.1	61.2
Heavy Trucks:	62.5	58.5	55.1	59.7	65.9	66.0
Vehicle Noise:	64.5	60.9	57.7	61.2	67.5	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	158	340
CNEL:	35	75	161	346

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	1,941 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	194 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-9.15	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.51	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.85	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	54.5	53.1	47.1	55.6	56.2
Medium Trucks:	57.3	53.4	45.9	54.7	60.9	60.9
Heavy Trucks:	62.3	58.2	54.8	59.5	65.7	65.8
Vehicle Noise:	64.3	60.7	57.4	60.9	67.2	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	152	327
CNEL:	33	72	154	333

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	15,230 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,523 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph	Vehicle Mix					
Near/Far Lane Distance:	36 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
		Autos: 75.5% 14.0% 10.5% 84.94%					
		Medium Trucks: 48.9% 2.2% 48.9% 7.83%					
		Heavy Trucks: 47.3% 5.4% 47.3% 7.23%					
		Noise Source Elevations (in feet)					
		Autos: 0.000					
		Medium Trucks: 2.297					
Barrier Height: 0.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0					
Barrier Type (0-Wall, 1-Berm): 0.0		Lane Equivalent Distance (in feet)					
Centerline Dist. to Barrier: 50.0 feet							
Centerline Dist. to Observer: 50.0 feet		Autos: 46.915					
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 46.726					
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 46.744					
Pad Elevation: 0.0 feet							
Road Elevation: 0.0 feet							
Road Grade: 0.0%							
Left View: -90.0 degrees							
Right View: 90.0 degrees							

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.72	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.07	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.42	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	64.8	63.5	57.5	65.9	66.6
Medium Trucks:	67.5	63.6	56.1	64.9	71.0	71.1
Heavy Trucks:	72.0	67.9	64.5	69.2	75.4	75.5
Vehicle Noise:	74.2	70.6	67.4	70.8	77.1	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	320	688	1,483
CNEL:	151	326	702	1,512

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	15,812 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,581 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data		Vehicle Mix					
		VehicleType	Day	Evening	Night	Daily	
		Autos:	75.5%	14.0%	10.5%	84.94%	
		Medium Trucks:	48.9%	2.2%	48.9%	7.83%	
		Heavy Trucks:	47.3%	5.4%	47.3%	7.23%	
		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:	46.915				
		Medium Trucks:	46.726				
		Heavy Trucks:	46.744				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.56	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.91	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.26	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.0	63.7	57.7	66.1	66.7
Medium Trucks:	67.7	63.8	56.3	65.0	71.2	71.2
Heavy Trucks:	72.1	68.1	64.7	69.3	75.5	75.6
Vehicle Noise:	74.3	70.8	67.6	70.9	77.2	77.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	706	1,521
CNEL:	155	334	719	1,550

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Perry St.
Road Segment: w/o Dwy. 1

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
Road Name: Perry St.
Road Segment: e/o Dwy. 1

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA Without Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Seaton Av.
 Road Segment: n/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	2,108 vehicles	Autos: 15				
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	211 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	40 mph	Vehicle Mix				
Near/Far Lane Distance:	36 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
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		Autos:	75.5%	14.0%	10.5%	85.28%
		Medium Trucks:	48.9%	2.2%	48.9%	7.66%
		Heavy Trucks:	47.3%	5.4%	47.3%	7.07%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment: 0.0		
		Lane Equivalent Distance (in feet)				
		Autos:	46.915			
		Medium Trucks:	46.726			
		Heavy Trucks:	46.744			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.78	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.25	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.59	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	54.8	53.5	47.5	55.9	56.6
Medium Trucks:	57.6	53.7	46.2	55.0	61.1	61.2
Heavy Trucks:	62.5	58.5	55.1	59.7	65.9	66.0
Vehicle Noise:	64.6	61.0	57.7	61.2	67.5	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	158	340
CNEL:	35	75	161	347

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,004 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	200 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.99	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.51	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.85	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.6	54.6	53.3	47.3	55.7	56.3
Medium Trucks:	57.3	53.4	45.9	54.7	60.9	60.9
Heavy Trucks:	62.3	58.2	54.8	59.5	65.7	65.8
Vehicle Noise:	64.3	60.7	57.5	60.9	67.2	67.4

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	152	327
CNEL:	33	72	155	333

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	15,240 vehicles	Autos: 15				
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,524 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	36 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 75.5% 14.0% 10.5% 84.95%				
		Medium Trucks: 48.9% 2.2% 48.9% 7.83%				
		Heavy Trucks: 47.3% 5.4% 47.3% 7.22%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 46.915				
		Medium Trucks: 46.726				
		Heavy Trucks: 46.744				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.72	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-11.07	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.42	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.9	64.8	63.5	57.5	65.9	66.6
Medium Trucks:	67.5	63.6	56.1	64.9	71.0	71.1
Heavy Trucks:	72.0	67.9	64.5	69.2	75.4	75.5
Vehicle Noise:	74.2	70.6	67.4	70.8	77.1	77.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	320	688	1,483
CNEL:	151	326	702	1,512

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	15,850 vehicles	Autos: 15				
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,585 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	36 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 75.5% 14.0% 10.5% 84.98%				
		Medium Trucks: 48.9% 2.2% 48.9% 7.81%				
		Heavy Trucks: 47.3% 5.4% 47.3% 7.21%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 46.915				
		Medium Trucks: 46.726				
		Heavy Trucks: 46.744				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.54	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.91	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.26	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.0	63.7	57.7	66.1	66.7
Medium Trucks:	67.7	63.8	56.3	65.0	71.2	71.2
Heavy Trucks:	72.1	68.1	64.7	69.3	75.5	75.6
Vehicle Noise:	74.4	70.8	67.6	70.9	77.2	77.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	706	1,521
CNEL:	155	334	720	1,550

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
Road Name: Perry St.
Road Segment: w/o Dwy. 1

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	256 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	26 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-17.63	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.0	46.0	44.7	38.7	47.1	47.7
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.6	50.3	47.4	49.8	56.2	56.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	29	62

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	224 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	22 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-18.26	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.4	44.0	38.0	46.4	47.1
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.5	50.0	47.1	49.8	56.2	56.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	28	61

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EA With Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	469 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	47 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-16.16	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-25.37	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.30	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.5	47.5	46.1	40.1	48.6	49.2
Medium Trucks:	51.5	47.6	40.1	48.8	55.0	55.0
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	61.6	57.7	54.3	58.6	64.8	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	226
CNEL:	23	49	107	230

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Seaton Av.
 Road Segment: n/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,097 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	210 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.82	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.17	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.52	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	54.8	53.5	47.5	55.9	56.5
Medium Trucks:	57.7	53.8	46.3	55.0	61.2	61.2
Heavy Trucks:	62.6	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	64.6	61.0	57.7	61.2	67.6	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	160	344
CNEL:	35	75	163	350

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	1,977 vehicles	Autos: 15				
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	198 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	40 mph	Vehicle Mix				
Near/Far Lane Distance:	36 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet		Autos:	75.5%	14.0%	10.5%	84.94%
Barrier Type (0-Wall, 1-Berm): 0.0		Medium Trucks:	48.9%	2.2%	48.9%	7.83%
Centerline Dist. to Barrier: 50.0 feet		Heavy Trucks:	47.3%	5.4%	47.3%	7.23%
Centerline Dist. to Observer: 50.0 feet		Noise Source Elevations (in feet)				
Barrier Distance to Observer: 0.0 feet		Autos:	0.000			
Observer Height (Above Pad): 5.0 feet		Medium Trucks:	2.297			
Pad Elevation: 0.0 feet		Heavy Trucks:	8.004	Grade Adjustment: 0.0		
Road Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Grade: 0.0%		Autos:	46.915			
Left View: -90.0 degrees		Medium Trucks:	46.726			
Right View: 90.0 degrees		Heavy Trucks:	46.744			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-9.07	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.43	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.77	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	54.5	53.2	47.2	55.6	56.3
Medium Trucks:	57.4	53.5	46.0	54.8	60.9	61.0
Heavy Trucks:	62.4	58.3	54.9	59.6	65.8	65.9
Vehicle Noise:	64.4	60.7	57.5	61.0	67.3	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	153	331
CNEL:	34	73	156	337

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	15,938 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,594 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.52	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.87	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.22	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.0	63.7	57.7	66.1	66.8
Medium Trucks:	67.7	63.8	56.3	65.1	71.2	71.3
Heavy Trucks:	72.2	68.1	64.7	69.4	75.6	75.7
Vehicle Noise:	74.4	70.8	67.6	71.0	77.3	77.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	153	329	710	1,529
CNEL:	156	336	723	1,558

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	16,576 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,658 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.35	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.70	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.05	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.2	63.9	57.9	66.3	66.9
Medium Trucks:	67.9	64.0	56.5	65.2	71.4	71.4
Heavy Trucks:	72.3	68.3	64.9	69.5	75.7	75.8
Vehicle Noise:	74.6	71.0	67.8	71.1	77.5	77.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	157	338	728	1,569
CNEL:	160	345	742	1,600

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Perry St.
 Road Segment: w/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data		Vehicle Mix					
		VehicleType	Day	Evening	Night	Daily	
		Autos:	75.5%	14.0%	10.5%	84.94%	
		Medium Trucks:	48.9%	2.2%	48.9%	7.83%	
		Heavy Trucks:	47.3%	5.4%	47.3%	7.23%	
		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:	46.915				
		Medium Trucks:	46.726				
		Heavy Trucks:	46.744				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 1

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC Without Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	145 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	15 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-20.41	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	43.2	41.9	35.9	44.3	44.9
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.0	49.4	46.1	49.7	56.0	56.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	27	58
CNEL:	6	13	27	59

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Seaton Av.
Road Segment: n/o Perry St.

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,144 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	214 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.71	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.17	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.52	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.9	54.9	53.6	47.6	56.0	56.6
Medium Trucks:	57.7	53.8	46.3	55.0	61.2	61.2
Heavy Trucks:	62.6	58.6	55.2	59.8	66.0	66.1
Vehicle Noise:	64.6	61.0	57.8	61.3	67.6	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	160	344
CNEL:	35	76	163	351

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
 Road Name: Seaton Av.
 Road Segment: s/o Perry St.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,040 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	204 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-8.91	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.43	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.77	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.7	54.7	53.4	47.4	55.8	56.4
Medium Trucks:	57.4	53.5	46.0	54.8	60.9	61.0
Heavy Trucks:	62.4	58.3	54.9	59.6	65.8	65.9
Vehicle Noise:	64.4	60.8	57.5	61.0	67.3	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	71	154	331
CNEL:	34	73	157	337

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
 Road Name: Markham St.
 Road Segment: w/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	15,948 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,595 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.52	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.87	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.22	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.0	63.7	57.7	66.1	66.8
Medium Trucks:	67.7	63.8	56.3	65.1	71.2	71.3
Heavy Trucks:	72.2	68.1	64.7	69.4	75.6	75.7
Vehicle Noise:	74.4	70.8	67.6	71.0	77.3	77.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	153	329	710	1,529
CNEL:	156	336	723	1,558

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
 Road Name: Markham St.
 Road Segment: e/o Seaton Av.

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	16,614 vehicles	Autos:					15
Peak Hour Percentage:	10%	Medium Trucks (2 Axles):					15
Peak Hour Volume:	1,661 vehicles	Heavy Trucks (3+ Axles):					15
Vehicle Speed:	45 mph	Vehicle Mix					
Near/Far Lane Distance:	36 feet						
		VehicleType	Day	Evening	Night	Daily	
Site Data		Autos: 75.5% 14.0% 10.5% 84.97%					
		Medium Trucks: 48.9% 2.2% 48.9% 7.81%					
		Heavy Trucks: 47.3% 5.4% 47.3% 7.21%					
		Noise Source Elevations (in feet)					
		Autos: 0.000					
		Medium Trucks: 2.297					
		Heavy Trucks: 8.004 Grade Adjustment: 0.0					
		Lane Equivalent Distance (in feet)					
		Autos: 46.915					
		Medium Trucks: 46.726					
		Heavy Trucks: 46.744					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.34	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-10.70	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.05	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.2	63.9	57.9	66.3	66.9
Medium Trucks:	67.9	64.0	56.5	65.2	71.4	71.4
Heavy Trucks:	72.3	68.3	64.9	69.5	75.7	75.8
Vehicle Noise:	74.6	71.0	67.8	71.1	77.5	77.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	157	338	728	1,570
CNEL:	160	345	743	1,600

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Perry St.
Road Segment: w/o Dwy. 1

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	224 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	22 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-18.26	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.4	44.0	38.0	46.4	47.1
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.5	50.0	47.1	49.8	56.2	56.3

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	28	61

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
Road Name: Perry St.
Road Segment: e/o Dwy. 1

Project Name: Seaton
Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	224 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	22 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-18.26	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-30.76	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-31.11	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	45.4	44.0	38.0	46.4	47.1
Medium Trucks:	46.1	42.2	34.7	43.4	49.6	49.7
Heavy Trucks:	51.0	47.0	43.6	48.2	54.4	54.5
Vehicle Noise:	53.5	50.0	47.1	49.8	56.2	56.3

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	6	13	28	60
CNEL:	6	13	28	61

Wednesday, October 2, 2019

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: EAC With Project
 Road Name: Perry St.
 Road Segment: e/o Dwy. 2

Project Name: Seaton
 Job Number: 11633

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	469 vehicles	Autos: 15					
Peak Hour Percentage:	10%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	47 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	40 mph						
Near/Far Lane Distance:	36 feet						
Site Data							
Barrier Height:	0.0 feet						
Barrier Type (0-Wall, 1-Berm):	0.0						
Centerline Dist. to Barrier:	50.0 feet						
Centerline Dist. to Observer:	50.0 feet						
Barrier Distance to Observer:	0.0 feet						
Observer Height (Above Pad):	5.0 feet						
Pad Elevation:	0.0 feet						
Road Elevation:	0.0 feet						
Road Grade:	0.0%						
Left View:	-90.0 degrees						
Right View:	90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-16.16	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-25.37	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.30	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.5	47.5	46.1	40.1	48.6	49.2
Medium Trucks:	51.5	47.6	40.1	48.8	55.0	55.0
Heavy Trucks:	60.8	56.8	53.4	58.0	64.2	64.3
Vehicle Noise:	61.6	57.7	54.3	58.6	64.8	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	226
CNEL:	23	49	107	230

Wednesday, October 2, 2019

APPENDIX 9.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R1

Source: Unloading/Docking Activity
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,074.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	1,064.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,074.0	-31.1	-31.1	-31.1	-31.1	-31.1	-31.1
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		18.5	-48.7	-48.7	-48.7	-48.7	-48.7
60 Minute Hourly Adjustment		18.5	-48.7	-48.7	-48.7	-48.7	-48.7

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R1

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	833.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	828.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	833.0	-44.4	-44.4	-44.4	-44.4	-44.4	-44.4
Shielding (Barrier Attenuation)	5.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		27.9	-49.3	-49.3	-49.3	-49.3	-49.3
60 Minute Hourly Adjustment		27.9	-49.3	-49.3	-49.3	-49.3	-49.3

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R1

Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	830.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	830.0 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	830.0	-28.8	-28.8	-28.8	-28.8	-28.8	-28.8
Shielding (Barrier Attenuation)	830.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		23.4	-28.8	-28.8	-28.8	-28.8	-28.8
60 Minute Hourly Adjustment		23.4	-28.8	-28.8	-28.8	-28.8	-28.8

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R2

Source: Unloading/Docking Activity
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	556.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	546.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	556.0	-25.4	-25.4	-25.4	-25.4	-25.4	-25.4
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		24.2	-43.0	-43.0	-43.0	-43.0	-43.0
60 Minute Hourly Adjustment		24.2	-43.0	-43.0	-43.0	-43.0	-43.0

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R2

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	196.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	191.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	196.0	-31.9	-31.9	-31.9	-31.9	-31.9	-31.9
Shielding (Barrier Attenuation)	5.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		39.7	-37.5	-37.5	-37.5	-37.5	-37.5
60 Minute Hourly Adjustment		39.7	-37.5	-37.5	-37.5	-37.5	-37.5

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R2

Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	136.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	136.0 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	136.0	-17.0	-17.0	-17.0	-17.0	-17.0	-17.0
Shielding (Barrier Attenuation)	136.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.2	-17.0	-17.0	-17.0	-17.0	-17.0
60 Minute Hourly Adjustment		35.2	-17.0	-17.0	-17.0	-17.0	-17.0

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R3

Source: Unloading/Docking Activity
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	527.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	517.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	527.0	-24.9	-24.9	-24.9	-24.9	-24.9	-24.9
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		24.7	-42.5	-42.5	-42.5	-42.5	-42.5
60 Minute Hourly Adjustment		24.7	-42.5	-42.5	-42.5	-42.5	-42.5

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R3

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	183.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	178.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	183.0	-31.3	-31.3	-31.3	-31.3	-31.3	-31.3
Shielding (Barrier Attenuation)	5.0	-5.7	-5.7	-5.7	-5.7	-5.7	-5.7
Raw (Distance + Barrier)		40.2	-37.0	-37.0	-37.0	-37.0	-37.0
60 Minute Hourly Adjustment		40.2	-37.0	-37.0	-37.0	-37.0	-37.0

STATIONARY SOURCE NOISE PREDICTION MODEL		10/3/2019
Observer Location: R3		Project Name: Seaton
Source: Parking Lot Vehicle Movements		Job Number: 11633
Condition: Operational		Analyst: B. Lawson
NOISE MODEL INPUTS		

Noise Distance to Observer	109.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	109.0 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	109.0	-15.6	-15.6	-15.6	-15.6	-15.6	-15.6
Shielding (Barrier Attenuation)	109.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		36.6	-15.6	-15.6	-15.6	-15.6	-15.6
60 Minute Hourly Adjustment		36.6	-15.6	-15.6	-15.6	-15.6	-15.6

STATIONARY SOURCE NOISE PREDICTION MODEL		10/3/2019
Observer Location: R4		Project Name: Seaton
Source: Unloading/Docking Activity		Job Number: 11633
Condition: Operational		Analyst: B. Lawson
NOISE MODEL INPUTS		

Noise Distance to Observer	783.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	773.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	783.0	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		21.3	-45.9	-45.9	-45.9	-45.9	-45.9
60 Minute Hourly Adjustment		21.3	-45.9	-45.9	-45.9	-45.9	-45.9

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R4

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	429.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	424.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	429.0	-38.7	-38.7	-38.7	-38.7	-38.7	-38.7
Shielding (Barrier Attenuation)	5.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Raw (Distance + Barrier)		33.4	-43.8	-43.8	-43.8	-43.8	-43.8
60 Minute Hourly Adjustment		33.4	-43.8	-43.8	-43.8	-43.8	-43.8

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R4

Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	374.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	374.0 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	374.0	-23.6	-23.6	-23.6	-23.6	-23.6	-23.6
Shielding (Barrier Attenuation)	374.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		28.6	-23.6	-23.6	-23.6	-23.6	-23.6
60 Minute Hourly Adjustment		28.6	-23.6	-23.6	-23.6	-23.6	-23.6

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R5

Source: Unloading/Docking Activity
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	699.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	689.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	699.0	-27.3	-27.3	-27.3	-27.3	-27.3	-27.3
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		22.3	-44.9	-44.9	-44.9	-44.9	-44.9
60 Minute Hourly Adjustment		22.3	-44.9	-44.9	-44.9	-44.9	-44.9

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R5

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	446.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	441.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	446.0	-39.0	-39.0	-39.0	-39.0	-39.0	-39.0
Shielding (Barrier Attenuation)	5.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Raw (Distance + Barrier)		33.1	-44.1	-44.1	-44.1	-44.1	-44.1
60 Minute Hourly Adjustment		33.1	-44.1	-44.1	-44.1	-44.1	-44.1

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R5

Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	418.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	418.0 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	418.0	-24.3	-24.3	-24.3	-24.3	-24.3	-24.3
Shielding (Barrier Attenuation)	418.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.9	-24.3	-24.3	-24.3	-24.3	-24.3
60 Minute Hourly Adjustment		27.9	-24.3	-24.3	-24.3	-24.3	-24.3

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R6

Source: Unloading/Docking Activity
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	1,013.0 feet	Barrier Height:	30.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	1,003.0 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	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,013.0	-30.6	-30.6	-30.6	-30.6	-30.6	-30.6
Shielding (Barrier Attenuation)	10.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Raw (Distance + Barrier)		19.0	-48.2	-48.2	-48.2	-48.2	-48.2
60 Minute Hourly Adjustment		19.0	-48.2	-48.2	-48.2	-48.2	-48.2

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R6

Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	811.0 feet	Barrier Height:	5.0 feet
Noise Distance to Barrier:	5.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	806.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	30.0 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	811.0	-44.2	-44.2	-44.2	-44.2	-44.2	-44.2
Shielding (Barrier Attenuation)	5.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		28.1	-49.1	-49.1	-49.1	-49.1	-49.1
60 Minute Hourly Adjustment		28.1	-49.1	-49.1	-49.1	-49.1	-49.1

STATIONARY SOURCE NOISE PREDICTION MODEL

10/3/2019

Observer Location: R6

Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: Seaton

Job Number: 11633

Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	787.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	787.0 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	787.0	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4
Shielding (Barrier Attenuation)	787.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		23.8	-28.4	-28.4	-28.4	-28.4	-28.4
60 Minute Hourly Adjustment		23.8	-28.4	-28.4	-28.4	-28.4	-28.4

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APPENDIX 9.2:

OPERATIONAL REFERENCE NOISE SOURCE PHOTOS

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Dry Storage Operational Reference Noise Source Photos



Background Trucks 01



Background Trucks 02



Background Trucks 03



Entry Gate 01



Truck Idle & Unloading 01



Truck Movement 01

Dry Storage Operational Reference Noise Source Photos



Truck Movement 02



Truck Movement 03



Truck Unloading 01



Truck Unloading 02

A large, tan-colored mobile office trailer is shown from a side-rear perspective. The trailer features a prominent 'LENNOX' logo in a maroon oval on the left side and a 'STRATEGOS' logo on the right. A ramp is extended from the rear of the trailer. Several smaller stickers are visible, including one that reads 'RTU-24' and another that says 'FABRICA'. The trailer is parked on a light-colored paved surface, and other trailers are visible in the background under a clear blue sky.

[illegible]

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Parking Lot Operational Reference Noise Source Photos



Parking Lot 01



Parking Lot 02



Parking Lot 03



Parking Lot 04



Parking Lot 05