Appendix H-1

Option 1 – Acoustical Assessment

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ACOUSTICAL ASSESSMENT
for the
Garden Gate Tower Project

San José, California

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JN 161936

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DEFINITIONS OF COMMONLY USED TERMS IN NOISE CONTROL

The definitions that follow are in general agreement with those contained in publications of various professional organizations, including the American National Standards Institute (ANSI); the American Society for Testing and Materials (ASTM); the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); the International Organization for Standardization (ISO); and the International Electrotechnical Commission (IEC).

TERMINOLOGY

acoustic; acoustical: *Acoustic* is usually used when the term being qualified designates something that has the properties, dimensions, or physical characteristics associated with sound waves (e.g., acoustic power); *acoustical* is usually used when the term which it modifies does not explicitly designate something that has the properties, dimensions, or physical characteristics of sound (e.g., acoustical material).

ambient noise: The all-encompassing noise associated with a given environment at a specified time, usually being a composite of sound from many sources arriving from many directions, near and far; no particular sound is dominant.

attenuation: The decrease in level of sound, usually from absorption, divergence, scattering, or the cancellation of the sound waves.

average sound level (L_{eq}): The level of a steady sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound. *Unit:* decibel.

A-weighted sound level (L_A): The sound level measured with a sound-level meter using A-weighting. *Unit*: decibel (dBA).

background noise: The total noise from all sources other than a particular sound that is of interest (e.g., other than the noise being measured or other than the speech or music being listened to).

decibel (dB): A unit of level which denotes the ratio between two quantities that are proportional to power; the number of decibels correspond to the logarithm (to the base 10) of this ratio. [In many sound fields, the sound pressure ratios are not proportional to the corresponding power ratios, but it is common practice to extend the use of the decibel to such cases. One decibel equals one-tenth of a *bel*.]

equivalent continuous sound level (average sound level) (L_{eq}): The level of a steady sound which, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound. *Unit*: decibel (dBA).

frequency (*f*): Of a periodic function, the number of times that a quantity repeats itself in one second, i.e., the number of cycles per second. *Unit*: hertz (Hz).

noise: Any disagreeable or undesired sound, i.e., unwanted sound.

noise level: Same as sound level. Usually used to describe the sound level of an unwanted sound.

noise reduction (NR): The difference in sound pressure level between any two points along a path of sound propagation.

sound: (1) A change in air pressure that is capable of being detected by the human ear.
(2) The hearing sensation excited by a change in air pressure.

sound level: Ten times the logarithm to the base 10 of the square of the ratio of the frequency-weighted (and time-averaged) sound pressure to the reference sound pressure of 20 micropascals. The frequency-weightings and time-weighting employed should be specified; if they are not specified, it is understood that A-frequency-weighting is used and that an averaging time of 0.125 is used. *Unit*: decibel (dBA).

SYMBOLS, ABBREVIATIONS, AND ACRONYMS

ADT	Average Daily Traffic
ANSI	American National Standards Institute
AM	Ante Meridiem
APN	Assessor's Parcel Number
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
Ldn	average day/night sound level
Leq	equivalent sound level
Lmax	maximum noise level
Lmin	minimum noise level
Ln	exceedance level
MPH	miles per hour
PM	Post Meridiem
PPV	peak particle velocity
STC	sound transmission class
VdB	velocity decibels

EXECUTIVE SUMMARY

The purpose of this Acoustical Assessment is to evaluate potential short- and long-term noise impacts resulting from implementation of the proposed Garden Gate Tower Project ("project" or "proposed project") in the City of San José (City).

The proposed project is located at 600 South 1st Street, in the City of San José, California. The project site is located south of East Reed Street and east of South 1st Street, within approximately 86 feet north of Interstate 280 (I-280) and approximately 0.5 miles east of State Route 87 (SR-87).

The Garden Gate Tower project proposes to demolish the existing two buildings to construct a mixed-use 27-story high rise tower. The 505,306-square foot tower would consist of 285 condominium units and 5,250 square feet of retail space on the ground floor. Other residential features would include three penthouse suites, a pool, common terrace, and an amenity area. The vehicular parking garage is planned from four levels below grade and would include 210 parking spaces and 72 bicycle racks. Vehicular parking would be accessible from South 1st Street and parking in the 3rd and 4th levels would be accessed through the alley off East Reed Street.

Temporary Impacts. Based upon the results of the analysis, noise from construction activities would not exceed the noise standards of the City of San José's Municipal Code at nearby residential uses with compliance with the recommended mitigation measures. Additionally, short-term vibration impacts from construction would be less than significant.

Long-Term Impacts. The analysis has concluded that the proposed project would result in less than significant impacts with regard to mobile noise sources with implementation of the recommend mitigation measures. Less than significant impacts have been identified with regard to stationary sources.

The project site is located within the Downtown land use designation (created in place of the Core Area designation as part of the Envision 2040 General Plan) and was analyzed within the San Jose Downtown Strategy 2000 Environmental Impact Report.

1.0 INTRODUCTION

The purpose of this Acoustical Assessment is to evaluate potential short- and long-term noise impacts resulting from implementation of the proposed Garden Gate Tower Project ("project" or "proposed project") in the City of San José (City).

1.1 PROJECT LOCATION

The proposed project is located at 600 South 1st Street, in the City of San José, California. The project site is located south of East Reed Street and east of South 1st Street, within approximately 86 feet north of Interstate 280 (I-280) and approximately 0.5 miles east of State Route 87 (SR-87); refer to Exhibit 1, *Regional Location*, and Exhibit 2, *Site Vicinity*.

1.2 PROJECT DESCRIPTION

The Garden Gate Tower project proposes to demolish the existing two buildings to construct a mixed-use 27-story high rise tower. The 505,306-square foot tower would consist of 285 condominium units and 5,250 square feet of retail space on the ground floor; refer to Exhibit 3, *Site Plan*. Other residential features would include three penthouse suites, a pool, common terrace, and an amenity area. The vehicular parking garage is planned from four levels below grade and would include 210 parking spaces and 72 bicycle racks. Vehicular parking would be accessible from South 1st Street and parking in the 3rd and 4th levels would be accessed through the alley off East Reed Street.

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0 10 20 miles
APPROXIMATE

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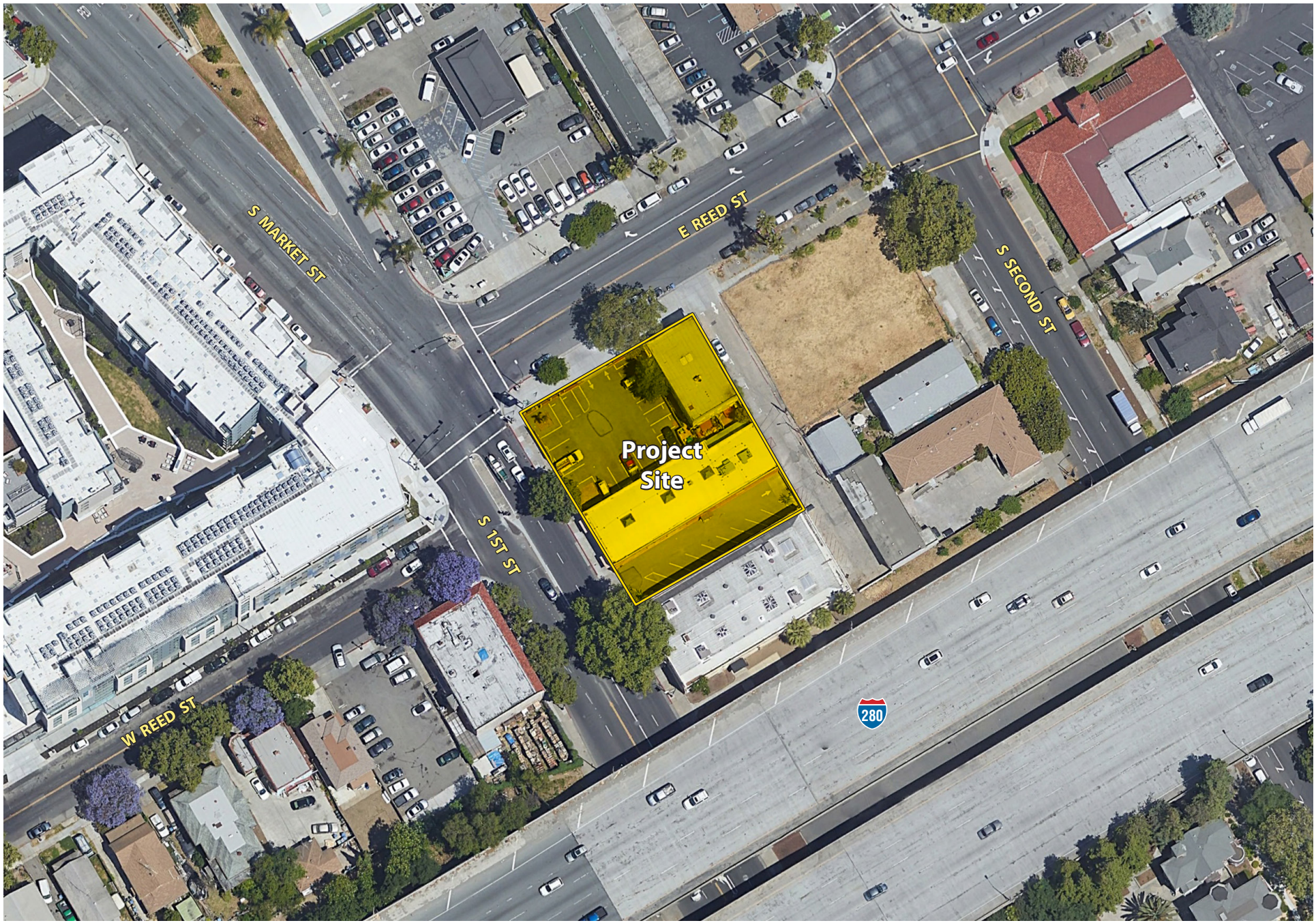
GARDEN GATE TOWER PROJECT • ACOUSTICAL ASSESSMENT

Regional Location

Exhibit 1



Source: Google Earth Pro, January 2018

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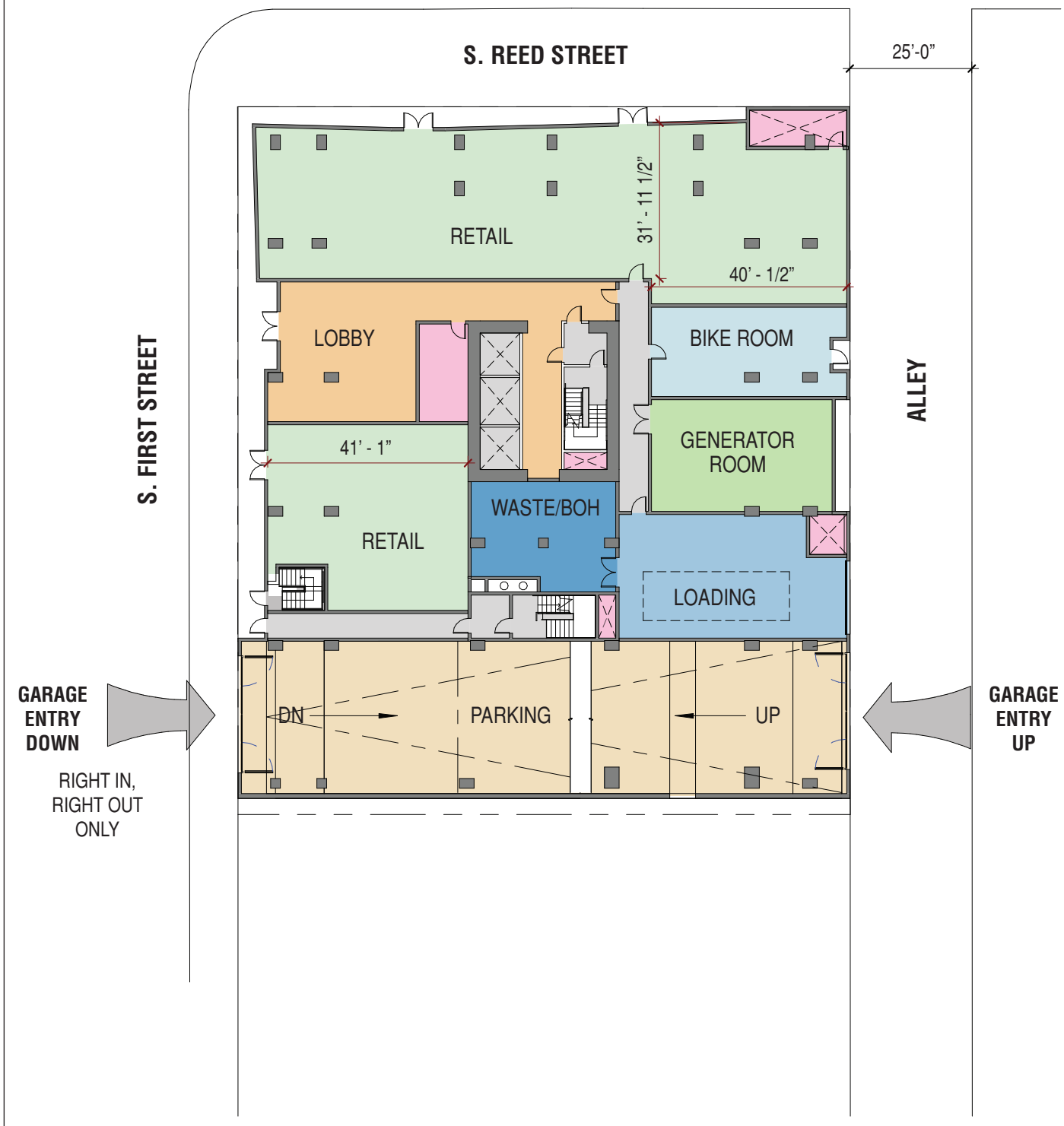
GARDEN GATE TOWER PROJECT • ACOUSTICAL ASSESSMENT

Site Vicinity

Exhibit 2



Source: C2K Architecture, Inc.

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GARDEN GATE TOWER PROJECT • ACOUSTICAL ASSESSMENT

Conceptual Site Plan

Exhibit 3

2.0 DESCRIPTION OF NOISE METRICS

2.1 STANDARD UNIT OF MEASUREMENT

Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by differentiating among frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is perceived to be twice as loud and 20 dBA higher is perceived to be four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are illustrated on Exhibit 4, *Common Environmental Noise Levels*.

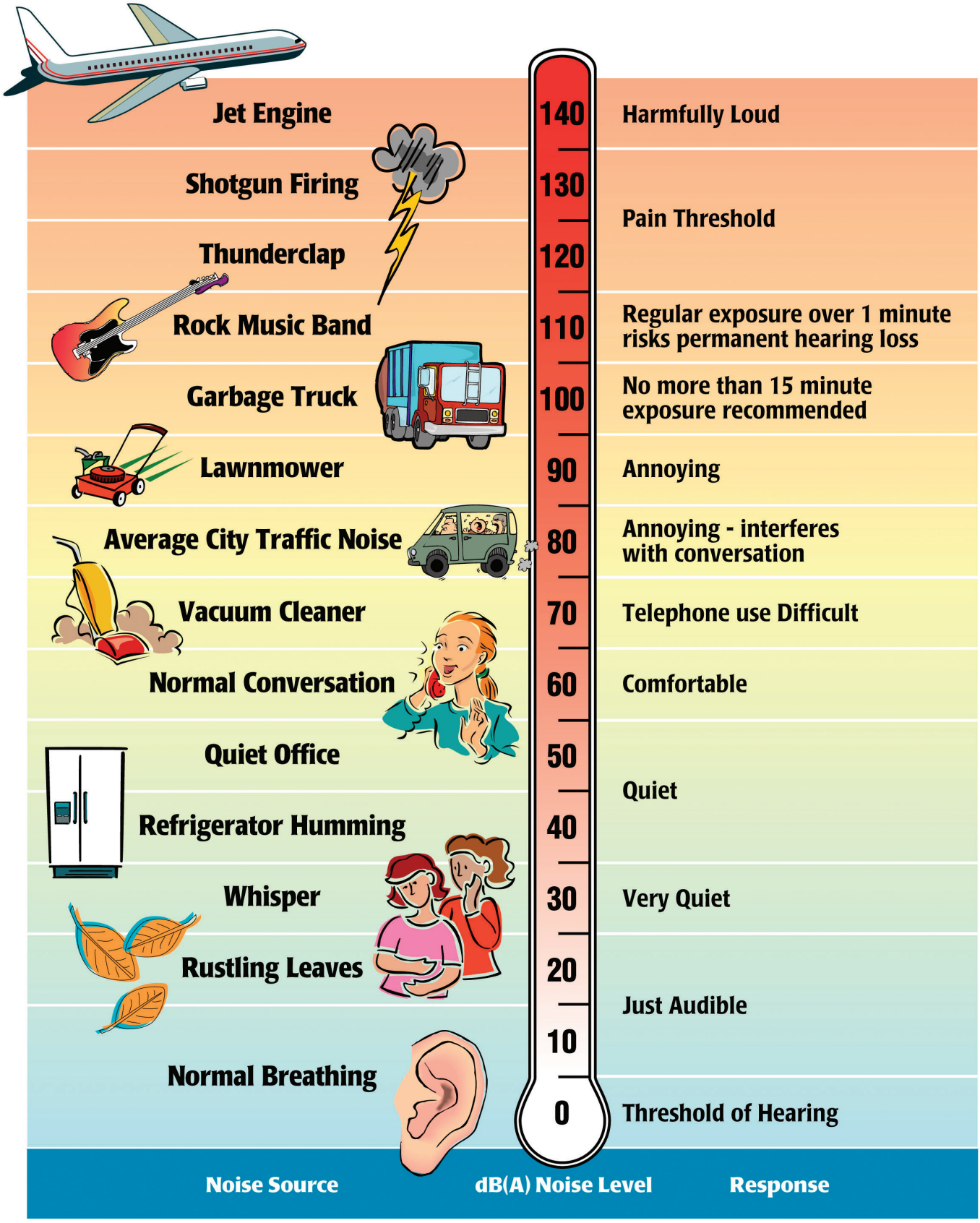
Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Table 1, *Noise Descriptors*, provides a listing of methods to measure sound over a period of time.

2.2 HEALTH EFFECTS OF NOISE

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise generally increases with the environmental sound level. However, many factors also influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses would range from "not annoyed" to "highly annoyed."



Source:

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

Table 1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM.
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the L_{eq}'s for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM) by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.
Source: Cyril M. Harris, *Handbook of Noise Control*, 1979.	

When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible, and as the noise level rises, dissatisfaction among the public steadily increases. However, an individual's reaction to a particular noise depends on many factors, such as the source of the sound, its loudness relative to the background noise, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

- Noise-Induced Hearing Loss;
- Interference with Communication;
- Effects of Noise on Sleep;
- Effects on Performance and Behavior;
- Extra-Auditory Health Effects; and
- Annoyance.

Although it often causes discomfort and sometimes pain, noise-induced hearing loss usually takes years to develop. Noise-induced hearing loss can impair the quality of life through a reduction in the ability to hear important sounds and to communicate with family and friends. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. While the loss may be temporary at first, it could become permanent after continued exposure. When combined with hearing loss associated with aging, the amount of hearing loss directly caused by the environment is difficult to quantify. Although the major cause of noise-induced hearing loss is occupational, substantial damage can be caused by non-occupational sources.

According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise.

Interference with communication has proven to be one of the most important components of noise-related annoyance. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Recent research indicates that more moderate noise levels can produce disruptive after-effects, commonly manifested as a reduced tolerance for frustration, increased anxiety, decreased incidence of “helping” behavior, and increased incidence of “hostile” behavior. Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. Most effects seem to be transitory, but with continued exposure some effects have been shown to be chronic in laboratory animals.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one's peace of mind and the enjoyment of one's environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the relationship between the effects of annoyance and the community were quantified. In areas where exterior noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA Community Noise Equivalent Level (CNEL), that percentage rises to 15 percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.

3.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Land uses deemed sensitive by the State of California (State) within the vicinity of the project site include schools. Many jurisdictions also consider single- and multi-family residential uses particularly noise-sensitive because families and individuals expect to use time in the home for rest and relaxation, and noise can interfere with those activities. Some jurisdictions may also identify other noise-sensitive uses such as churches. Land uses that are relatively insensitive to noise include office, commercial, and retail developments. There is a range of insensitive noise receptors that include uses that generate significant noise levels and that typically have a low level of human occupancy.

This noise analysis was conducted in accordance with Federal, State, and local criteria described in the following sections.

3.1 U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) offers guidelines for community noise exposure in the publication *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*. These guidelines consider occupational noise exposure as well as noise exposure in homes. The EPA recognizes an exterior noise level of 55 decibels day-night level (dB L_{dn}) as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The EPA and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 to 65 dB L_{dn} are acceptable. However, the EPA notes that these levels are not regulatory goals, but are levels defined by a negotiated scientific consensus, without concern for economic and technological feasibility or the needs and desires of any particular community.

3.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The State Office of Planning and Research Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

3.3 LOCAL JURISDICTION

CITY OF SAN JOSÉ GENERAL PLAN

The Noise Element of the *Envision San José 2040 General Plan* (General Plan), adopted November 1, 2011, establishes noise standards for planning purposes need to examine outdoor and indoor noise levels acceptable for different uses. The standards relate to existing conditions in the City so that they are realistically enforceable and consistent with other General Plan policies. The Noise Element seeks to limit the impacts of noise on residents and employees in two ways. The Noise Element contains standards to determine the suitability of new land uses depending upon the extent of noise exposure in the area. The Noise Element's policies limit the extent of new noise sources that proposed development can add to existing noise levels in the surrounding area and through implementation of the City's Noise Ordinance, which limits what is commonly described as "nuisance noise." The following lists applicable noise goals and targets that apply to the proposed project obtained from the General Plan:

Goal EC-1: ***Community Noise Levels and Land Use Compatibility.*** *Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.*

Policy EC-1.1 *Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state and City noise standards and guidelines as a part of new development review. Applicable standards and guidelines for land uses in San José include:*

Interior Noise Levels

- *The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA Day/Night Average Sound Level (DNL). Include appropriate site and building design, building construction and noise attenuation techniques in new development to meet this standard. For sites with exterior noise levels of 60 dBA DNL or more, an acoustical analysis following protocols in the City-adopted California Building Code is required to demonstrate that development projects can meet this standard. The acoustical analysis shall base required noise attenuation techniques on expected Envision General Plan traffic volumes to ensure land use compatibility and General Plan consistency over the life of this plan.*

Exterior Noise Levels

- *The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses. The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below:*

– *For new multi-family residential projects and for the residential component of mixed-use development, use a standard of 60 dBA DNL in usable outdoor activity areas, excluding balconies and residential stoops and porches facing existing roadways. Some common use areas that meet the 60 dBA DNL exterior standard will be available to all residents. Use noise attenuation techniques such as shielding by buildings and structures for outdoor common use areas. On sites subject to aircraft overflights or adjacent to elevated roadways, use noise attenuation techniques to achieve the 60 dBA DNL standard for noise from sources other than aircraft and elevated roadway segments.*

– *For single family residential uses, use a standard of 60 dBA DNL for exterior noise in private usable outdoor activity areas, such as backyards.*

Table 2, *Land Use Compatibility Guidelines for Community Noise in San José*, provides the range of acceptable noise levels for various land uses in the City, as established by the General Plan.

Table 2
Land Use Compatibility Guidelines for Community Noise in San José

Land Use Category	Exterior Noise Exposure (DNL in dBA)		
	Normally Acceptable	Conditionally Acceptable	Clearly Unacceptable
Residential, Hotels and Motels, Hospitals and Residential Care[1]	50 – 60	60 – 75	75 – 85
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	50 – 65	65 – 80	80 – 85
Schools, Libraries, Museums, Meeting Halls, Churches	50 – 60	60 – 75	75 – 85
Office Buildings, Business Commercial, and Professional Offices	50 – 70	70 – 80	80 – 85
Sports Arena, Outdoor Spectator Sports	50 – 70	70 – 80	80 – 85
Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	70 – 85

[1] Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

NA: Not Applicable; Ldn/DNL: average day/night sound level.

Notes:
Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable - Specific land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.
Clearly Unacceptable – New construction or development should not be undertaken.

Source: City of San José, *Envision San José 2040 General Plan Noise and Vibration*, amended November 1, 2011.

Policy EC-1.2 *Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:*

- *Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable"; or*

- *Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.*

Policy EC-1.4 *Include appropriate noise attenuation techniques in the design of all new General Plan streets projected to adversely impact noise sensitive uses.*

Policy EC-1.7 *Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:*

- *Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.*

- *For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.*

Policy EC-1.9 *Require noise studies for land use proposals where known or suspected loud intermittent noise sources occur which may impact adjacent existing or planned land uses. For new residential development affected by noise from heavy rail, light rail, BART or other single-event noise sources, implement mitigation so that recurring maximum instantaneous noise levels do not exceed 50 dBA L_{max} in bedrooms and 55 dBA L_{max} in other rooms.*

Policy EC-1.11 *Require safe and compatible land uses within the Mineta International Airport noise zone (defined by the 65 CNEL contour as set forth in State law) and encourage aircraft operating procedures that minimize noise.*

Action EC-1.13 *Update noise limits and acoustical descriptors in the Zoning Code to clarify noise standards that apply to land uses throughout the City.*

Action EC-1.14 *Require acoustical analyses for proposed sensitive land uses in areas with exterior noise levels exceeding the City's noise and land use compatibility standards to base noise attenuation techniques on expected Envision General Plan traffic volumes to ensure land use compatibility and General Plan consistency.*

Policy EC-2.3 *Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.*

CITY OF SAN JOSÉ MUNICIPAL CODE

Section 20.100.450, Hours of Construction Within 500 Feet of a Residential Unit, of the *San José Municipal Code* (Municipal Code), specifies the following standard exceptions to the provisions of Section 20.100.450.

A. *Unless otherwise expressly allowed in a Development Permit or other planning approval, no applicant or agent of an applicant shall suffer or allow any construction activity on a site located within 500 feet of a residential unit before 7:00 a.m. or after 7:00 p.m., Monday through Friday, or at any time on weekends.*

4.0 EXISTING CONDITIONS

4.1 NOISE MEASUREMENTS

In order to quantify existing ambient noise levels in the project area, Michael Baker International (Michael Baker) conducted three noise measurements on January 10, 2018; refer to Table 3, *Noise Measurements*. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site. Ten-minute measurements were taken between 1:00 p.m. and 2:00 p.m., at each site during the day. Short-term (L_{eq}) measurements are considered representative of the noise levels in the project vicinity.

Table 3
Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time
1	South-east corner of 2nd Second Street and East Reed Street intersection (midblock).	66.9	59.9	76.0	88.6	1:28 p.m.
2	South-east corner of South 1st Street and East Reed Street intersection.	68.1	59.4	81.6	96.4	1:16 p.m.
3	West of the intersection of South 1st Street and West Reed Street.	69.2	64.4	79.6	96.5	1:44 p.m.

Source: Michael Baker International, January 10, 2018.

Meteorological conditions were clear skies, cool temperatures, with light wind speeds (0 to 5 miles per hour), and low humidity. Measured noise levels during the daytime measurements ranged from 66.9 to 69.2 dBA L_{eq}. Noise monitoring equipment used for the ambient noise survey consisted of a Larson Davis SoundExpert LxT Class 1 Sound Level Meter. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. The results of the field measurements are included in Appendix A, *Noise Data*. Refer to Exhibit 5, *Noise Measurement Locations*, for the noise measurement sites.

Source: Google Earth Pro, January 2018

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NOT TO SCALE

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GARDEN GATE TOWER PROJECT • ACOUSTICAL ASSESSMENT

Noise Measurement Locations

Exhibit 5

4.2 SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. Existing sensitive receptors located in the project vicinity include residential uses, schools, places of worship, and parks. Sensitive receptors are listed in Table 4, *Sensitive Receptors*.

Table 4
Sensitive Receptors

Type	Name	Distance from Project Site (feet) [1]	Direction from Project Site	Location
Residential	Residential Uses	103	North	45 East Reed Street, San José, CA 95112
		25	East	610 South 2nd Street, San José, CA 95112
		81	West	2 Pierce Avenue, San José, CA 95110
		80	West	601 South 1st Street, San José, CA 95113
Schools	Notre Dame High School	360	North	596 South 2nd Street, San José, CA 95112
	Lowell Elementary School	1,705	Northeast	625 South 7th Street, San José, CA 95112
	Rocketship Mateo Sheedy Elementary School	1,911	Southwest	788 Locust Street, San José, CA 95110
	Washington Elementary School	1,956	Southwest	100 Oak Street, San José, CA 95110
	Sacred Heart School	2,963	Southwest	325 Willow Street, San José, CA 95110
Places of Worship	First Christian Church	3,558	Northeast	80 South 5th Street, San José, CA 95112
	The Church of Jesus Christ of Latter-day Saints	3,896	Northeast	66 South 7th Street, San José, CA 95135
	Lima-Campagna-Alameda Mission Chapel	235	East	600 South 2nd Street, San José, CA 95112
	Sacred Heart of Jesus Parish	2,963	Southwest	325 Willow Street, San José, CA 95110
	San José Word of Faith	4,268	Southwest	873 Delmas Avenue, San José, CA 95125
	Star of David Church	4,274	Southwest	520 West Virginia Street, San José, CA 95125
	Cathedral Basilica of St. Joseph	3,168	Northwest	80 South Market Street, San José, CA 95113
	St. Paul's United Methodist Church	2,994	Northeast	405 South 10th Street, San José, CA 95112
Parks	Parque De Los Pobladores	218	Northwest	Along South Market Street, San José, CA 95110
	Bestor Art Park	2,725	Southeast	955 South 6th Street, San José, CA 95112
	Cadwallader Park	2,980	Southeast	Along South 1st Street, San José, CA 95110
	Guadalupe River Park	2,011	Northwest	438 Coleman Avenue, San José, CA 95110

Note:
1 – Distances are measured from the exterior boundaries of the proposed building and parking structure within the project site.
Source: Google Earth, 2018.

4.3 EXISTING NOISE LEVELS

MOBILE SOURCES

Traffic Noise

The majority of the existing noise in the project area is generated from vehicle sources along Interstate 280 (I-280), South 1st Street/Market Street, and East Reed Street. According to the *600 South First Street – Garden Gate Tower Traffic Operational Analysis Memorandum* (Traffic Impact Memorandum), prepared by Kimley-Horn and Associates (November 15, 2017), average daily traffic (ADT) volumes along South 1st Street/Market Street range from 18,463 to 25,950 ADT, and traffic volumes along Reed Street range from 6,244 to 7,107 ADT in the project vicinity.

Existing noise levels for these roadways were calculated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the Traffic Impact Memorandum (see Appendix A, *Noise Data*). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans). A 25- to 35-mile per hour (mph) average vehicle speed was assumed for existing conditions based on empirical observations and posted maximum speeds along the adjacent roadways. The average daily noise levels along these roadway segments are presented in Table 5, *Existing Traffic Noise Levels*. As noted in Table 5, existing ambient noise levels along these roadways range from 56.8 to 66.0 dBA CNEL.

Table 5
Existing Traffic Noise Levels

Roadway Segment	ADT	dBA CNEL @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]		
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour
South 1st Street/Market Street					
North of Reed Street	18,463	63.1	228	72	23
South of Reed Street	25,950	66.0	447	142	45
Reed Street					
East of South 1st Street/Market Street	7,107	57.4	61	19	6
West of South 1st Street/Market Street	6,244	56.8	54	17	5

Source: Noise modeling is based upon traffic data within the *600 South First Street – Garden Gate Tower Traffic Operational Analysis Memorandum,* prepared by Kimley-Horn and Associates, November 17, 2017.

I-280, trending in an east-west direction to the south of the project site, has annual average daily traffic (AADT) volumes of 195,000.[1] According to the *Draft Program Environmental Impact Report for the Envision San José 2040 General Plan* (City of San José, June 2011) (General Plan EIR), the project site is located within the 70-75 dB L_{dn} noise contour for I-280.

Aircraft Noise

According to the General Plan EIR, the project site is located within the Norman Y. Mineta San José International Airport (San José Airport) 2027 60 dB CNEL noise contour.

STATIONARY SOURCES

The project area is located in an urbanized area. The primary sources of stationary noise in the project vicinity are urban-related activities, including parking areas, people talking, truck deliveries, etc. The noise associated with these sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

[1] California Department of Transportation, *2016 Traffic Volumes on California State Highways*, http://www.dot.ca.gov/trafficops/census/docs/2016_aadt_volumes.pdf, accessed January 19, 2018.

5.0 POTENTIAL ACOUSTICAL IMPACTS

CEQA THRESHOLDS

Appendix G of the *CEQA Guidelines* contains analysis guidelines related to the assessment of noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. As stated in Appendix G, a project would create a significant environmental impact if it would:

- Expose persons to, or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (refer to Impact Statement NOI-1);

- Expose persons to or generate excessive ground borne vibration or ground borne noise levels (refer to Impact Statement NOI-2);

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statement NOI-1);

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statement NOI-1);

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels (refer to Impact Statement NOI-3); and

- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels (refer to Impact Statement NOI-3).

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are provided for all potentially significant impacts.

SIGNIFICANCE OF CHANGES IN TRAFFIC NOISE LEVELS

An off-site traffic noise impact typically occurs when there is a discernable increase in traffic and the resulting noise level exceeds an established noise standard. In community noise considerations, changes in noise levels greater than 3 dB are often identified as substantial, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. However, this is based on a direct, immediate comparison of two sound levels. Community noise exposures occur over a long period of time and changes in noise levels occur over years (rather than the immediate

comparison made in a laboratory situation). Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB is the most commonly accepted discernable difference. A 5 dBA change is generally recognized as a clearly discernable difference.

The following General Plan Noise Element Policy EC-1.2 for traffic noise increases is used to determine if a noise-sensitive land use would be impacted and would therefore require mitigation:

- Cause the DNL at noise sensitive receptors to increase by 5 dBA DNL or more where the noise levels would remain "Normally Acceptable"; or

- Cause the DNL at noise sensitive receptors to increase by 3 dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

Noise level impacts are assessed by evaluating the noise levels "with" and "without" the project for the following scenarios: Existing (Without Project), and Existing Plus Project conditions.

NOI-1

- ***EXPOSE PERSONS TO, OR GENERATE NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES?***

- ***A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT?***

- ***A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT?***

Level of Significance Before Mitigation: *Potentially Significant Impact.*

SHORT-TERM CONSTRUCTION

Construction of the proposed project would occur over approximately 26 months and would include demolition, grading, paving, building construction, and architectural coating. Ground-borne noise and other types of construction-related noise impacts would typically occur during excavation activities of the grading phase. This phase of construction has the potential to create the highest levels of noise. Typical noise levels generated by construction equipment are shown in Table 6, *Maximum Noise Levels Generated by Construction Equipment*. It should be noted that the noise levels identified in Table 6 are maximum sound levels (L_{max}), which are the highest

individual sound occurring at an individual time period. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

Table 6
Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Acoustical Use Factor[1]	L_{max} at 50 Feet (dBA)
Concrete Saw	20	90
Crane	16	81
Concrete Mixer Truck	40	79
Backhoe	40	78
Dozer	40	82
Excavator	40	81
Forklift	40	78
Paver	50	77
Roller	20	80
Tractor	40	84
Water Truck	40	80
Grader	40	85
General Industrial Equipment	50	85

Note:
1 – Acoustical Use Factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.

Pursuant to Municipal Code Section 20.100.450, construction activities may only occur between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, unless permission is granted with a development permit or other planning approval. Construction activities are prohibited on the weekends at sites within 500 feet of a residence. These permitted hours of construction are included in the code in recognition that construction activities undertaken during daytime hours are a typical part of living in an urban environment and do not cause a significant disruption. The potential for construction-related noise to affect nearby residential receptors would depend on the location and proximity of construction activities to these receptors. Construction would occur throughout the project site and would not be concentrated or confined in the area directly adjacent to sensitive receptors. Therefore, construction noise would be acoustically dispersed throughout the project site and not concentrated in one area near adjacent sensitive uses. It should be noted that the noise levels depicted in Table 6 are maximum noise levels, which would occur sporadically when construction equipment is operated in proximity to sensitive receptors. Given the sporadic and variable nature of proposed project construction and the implementation of time limits specified in the Municipal Code, noise impacts would be reduced to a less than significant level. Additionally, to further reduce the potential for noise impacts, Mitigation Measure NOI-1 would be implemented to incorporate best management practices during

construction. Implementation of Mitigation Measure NOI-1 would further minimize impacts from construction noise as it requires construction equipment to be equipped with properly operating and maintained mufflers and other state required noise attenuation devices. Thus, with mitigation, a less than significant noise impact would result from construction activities.

LONG-TERM OPERATIONAL IMPACTS

Off-Site Mobile Noise

Future development generated by the proposed project would result in additional traffic on adjacent roadways, thereby increasing vehicular noise in the vicinity of existing and proposed land uses. Based on the Traffic Impact Memorandum, the proposed project would result in approximately 1,653 net daily trips. The "Existing Without Project" and "Existing Plus Project" scenarios are compared in Table 7, *Existing Plus Project Traffic Noise Levels*. As depicted in Table 7, under the "Existing Without Project" scenario, noise levels would range from approximately 56.8 to 66.0 dBA CNEL, with the highest noise levels (66.0 dBA CNEL) occurring along South 1st Street/Market (south of East Reed Street). The "Existing Plus Project" scenario noise levels would range from approximately 56.9 to 66.2 dBA CNEL with the highest noise levels also occurring along South 1st Street/Market (south of East Reed Street). The noise levels would result in a maximum increase of 0.5 dBA CNEL as a result of the proposed project. This increase would occur along East Reed Street (east of South 1st Street/Market Street).

Table 7
Existing Plus Project Traffic Noise Levels

Roadway Segment	Existing Without Project					Existing Plus Project					Difference In dBA @ 100 Feet from Roadway
	ADT	dBA CNEL @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA CNEL @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
South 1st Street/Market Street											
North of Reed Street	18,463	63.1	228	72	23	19,001	63.2	235	74	23	0.1
South of Reed Street	25,950	66.0	447	142	45	26,994	66.2	465	147	47	0.2
Reed Street											
East of South 1st Street/ Market Street	7,107	57.4	61	19	6	8,026	57.9	69	22	7	0.5
West of South 1st Street/ Market Street	6,244	56.8	54	17	5	6,344	56.9	54	17	5	0.1

Notes: ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Source: Noise modeling is based upon traffic data within the *600 South First Street – Garden Gate Tower Traffic Operational Analysis Memorandum,* prepared by Kimley-Horn and Associates, November 17, 2017.

It is noted that although traffic noise levels would exceed the City's "Normally Acceptable" limit of 60 dBA for residential land uses the Existing Plus Project conditions, the project's contribution to traffic noise levels would not be perceivable (i.e., increases would be less than 3 dBA). Therefore, the proposed project would not significantly increase noise levels along the roadway segments analyzed, and a less than significant impact would occur.

On-Site Mobile Noise

Interior Noise at Residences

Future residents at the project site would be exposed to traffic noise along South 1st Street/Market Street, East Reed Street, and I-280. As previously noted, traffic noise levels along South 1st Street/Market Street would be a maximum of 66.2 dBA CNEL under "Existing Plus Project" conditions. In addition, as discussed in Section 4.3, *Existing Noise Levels*, the project site is located within the 70-75 dB L_{dn} noise contour for I-280. As such, interior noise levels at future on-site residences would be a maximum of 51 dBA,[2] which would exceed the City's 45 dBA L_{dn} (or DNL) interior noise standard. General Plan Policy EC-1.1 requires the use of noise attenuation techniques to reduce interior noise levels below the 45 dBA standard. Consistent with Policy EC-1.1, the project would be required to comply with Mitigation Measures NOI-2, which requires the construction of all windows at the on-site residential dwelling units with a minimum Sound Transmission Class (STC) rating of 37 to ensure interior noise levels are below the City's 45 dBA interior requirement. Compliance with Mitigation Measures NOI-2 would result in a less than significant impact in this regard.

Exterior Noise at Outdoor Areas

The proposed project would include an outdoor pool area and common terrace on the 27th floor of the new mixed-use building. As discussed above, the project site is located within the 70-75 dB L_{dn} I-280 traffic noise contours. As such, on-site residents using the outdoor pool area terrace could be exposed to traffic noise levels that exceed the City's 60 dBA L_{dn} exterior noise standard. Therefore, to attenuate traffic noise levels at the outdoor pool and common terrace area on the 27th floor of the proposed mixed-use building, the project would be required to construct parapet walls (a minimum height of five feet along the outer edges of the outdoor pool and common terrace area on the 27th floor; refer to Mitigation Measure NOI-3. The parapet walls would reduce exterior noise levels at these outdoor residential use areas to 60 dBA L_{dn} or less.[3] A less than significant impact would occur with implementation of Mitigation Measure NOI-3.

[2] A typical building can reduce noise levels by 24 dBA with the windows closed (United States Environmental Protection Agency, *Protective Noise Levels*, November 1978). This assumes all windows and doors are closed, thereby attenuating the exterior noise levels by 24 dBA.

[3] Federal Highway Administration, *Roadway Construction Noise Model User's Guide*, January 2006.

STATIONARY NOISE IMPACTS

The project proposes a 505,306 square-foot mixed-use residential building with 285 condominium units and 5,250 square feet of ground floor retail space. A un underground parking garage would provide 210 parking spaces for residents and retail consumers. Noise that is typical of these facilities includes delivery trucks traveling on the site, mechanical equipment, and parking lot activities.

Slow-Moving Trucks (Deliveries)

The proposed project may involve occasional deliveries from slow-moving trucks. Typically, trucks used to make deliveries can generate a maximum noise level of 75 dBA at a distance of 50 feet. These are levels generated by a truck that is operated by a typically experienced driver with typically applied accelerations. Higher noise levels may be generated by the excessive application of power. Lower levels may be achieved, but would not be considered representative of a nominal truck operation. Any deliveries to the project site would occur via the facility entrance along South 1st Street into the loading/unloading area of the parking garage. The loading/unloading area would be fully enclosed and noise truck idling/loading/unloading would be inaudible at the nearest sensitive receptors (adjoining the project site to the east).

Parking Areas

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the DNL (or L_{dn}) scale. However, the instantaneous maximum sound levels generated by a car door slamming, engine starting up and car pass-bys may be an annoyance to adjacent noise-sensitive receptors. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 8, *Typical Noise Levels Generated by Parking Lots*. The project proposes a four-story underground parking garage with approximately 210 parking spaces. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 48 feet for normal speech to 50 dBA at 50 feet for very loud speech.

Table 8
Typical Noise Levels Generated by Parking Lots

Noise Source	Maximum Noise Levels at 50 Feet from Source
Car door slamming	63 dBA Leq
Car starting	60 dBA Leq
Car idling	61 dBA Leq

Impacts associated with parking would be considered minimal since the parking area would be enclosed within a structure. It should be noted that parking lot noise are instantaneous noise levels compared to noise standards in the DNL scale, which are averaged over time. As a result, actual noise levels over time resulting from parking lot activities would be far lower. In addition, parking lot noise would also be partially masked by background noise from traffic along, East Reed Street, South 1st Street/Market Street, and I-280. Further, parking lot noise is currently generated on the project site, and at uses to the northeast, east, south, and west of the project site under existing conditions. Noise associated with parking lot activities is not anticipated to exceed the City's Noise Standards or the California Land Use Compatibility Standards during operation. Therefore, noise impacts from parking lots would be less than significant.

Mechanical Equipment

Typically, mechanical equipment noise is 55 dBA at 50 feet from the source. Mechanical equipment (heating, ventilation, and air condition [HVAC], fire and water pump equipment, generator room etc.) for the project would be located in fully enclosed spaces throughout the proposed mixed-use building. In addition, there would be dedicated rooms/spaces for mechanical exhaust (e.g., for HVAC equipment, etc.). Therefore, the project would not place mechanical equipment near residential uses, and noise from this equipment would not be perceptible at the closest sensitive receptors (existing multi-family residences adjoining the project site to the east). Impacts from mechanical equipment would be less than significant.

Mitigation Measures/Standard Permit Conditions:

The Downtown Strategy Final PEIR identified measures that would reduce project noise impacts to less than significant levels. Consistent with the certified Downtown Strategy Final PEIR and City General Plan policies, the project shall implement the following standard permit conditions during all phases of construction on the project site to reduce emissions:

NOI-1 Prior to Grading Permit issuance, the Project Applicant shall demonstrate, to the satisfaction of the San José Planning Division that the project complies with the following:

- Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other state required noise attenuation devices.

- Property owners and occupants located within 250 feet of the project boundary shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the project construction site. All notices and signs shall be reviewed and approved by the City of San José Community Development Director (or designee), prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide

a contact name and a telephone number where residents can inquire about the construction process and register complaints.

- The Contractor shall provide evidence that a construction staff member will be designated as a Noise Disturbance Coordinator and will be present on-site during construction activities. The Noise Disturbance Coordinator shall be responsible for responding to any local complaints about construction noise. When a complaint is received, the Noise Disturbance Coordinator shall notify the City within 24-hours of the complaint and determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall implement reasonable measures to resolve the complaint, as deemed acceptable by the Community Development Director (or designee). All notices that are sent to residential units immediately surrounding the construction site and all signs posted at the construction site shall include the contact name and the telephone number for the Noise Disturbance Coordinator.

- Prior to issuance of any Grading or Building Permit, the Project Applicant shall demonstrate to the satisfaction of the Community Development Director (or designee) that construction noise reduction methods shall be used where feasible. These reduction methods include shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and electric air compressors and similar power tools.

- Construction haul routes shall be designed to avoid noise sensitive uses (e.g., residences, convalescent homes, etc.), to the extent feasible.

- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.

- Construction activities within 500 feet of a residential unit shall not take place outside of the allowable hours specified by the City's Municipal Code Section 20.100.450 (7:00 a.m. and 7:00 p.m. on weekdays, or any time on weekends and holidays).

(Mitigation Measure NOI-1 correlates with Mitigation Measures NOI-5a and NOI-5b in the San Jose Downtown Strategy 2000 Final EIR. This mitigation measure includes updates to specifically address the project).

NOI-2 Sound-rated windows and entry doors with a minimum STC rating of 37 shall be installed at all residential dwelling units on the project site. After the plot plans and architectural drawings have been developed, and prior to the issuance of building permits, the plans specifying the 37 STC rating shall be shall be submitted to and approved by the City of San José Planning Director.

(Mitigation Measure NOI-2 correlates with Mitigation Measures NOI-1a and NOI-1b in the San Jose Downtown Strategy 2000 Final EIR. This mitigation measure includes updates to specifically address the project).

NOI-3 The construction of five-foot high parapet walls, as measured above the base elevation of the outdoor pool area and located along all outer edges of the residential towers (i.e., the rooftop pool deck and common terrace areas) would reduce exterior noise levels in outdoor residential use areas to 60 dBA L_{dn} or less. To be effective, the parapet wall shall be constructed with a solid material with no gaps in the face of the wall or at the base. Openings or gaps between sound wall materials or the ground substantially reduce the effectiveness of the sound wall. Suitable materials for sound wall construction should have a minimum surface weight of three pounds per square foot (such as 1-inch-thick wood, ½-inch laminated glass, masonry block, or concrete). The final recommendations for design shall be submitted and approved by the City of San José Planning Director.

(Mitigation Measure NOI-3 correlates with Mitigation Measures NOI-1a and NOI-1b in the San Jose Downtown Strategy 2000 Final EIR. This mitigation measure includes updates to specifically address the project).

The project would be required to implement the measures listed above as conditions of approval. These measures will be placed on project plan documents prior to issuance of any grading permits for the project. The proposed project, therefore, would not result in a significant noise impact.

Level of Significance After Mitigation: *Less Than Significant Impact With Mitigation Incorporated.*

NOI-2 EXPOSURE OF PERSONS TO OR GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

SHORT-TERM CONSTRUCTION

Project construction can generate varying degrees of groundborne vibration, depending on the construction procedure and the construction equipment used. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the Federal Transit Administration (FTA) guidelines show that a vibration level of up to 0.50 inch per second (in/sec) (102 velocity decibels [VdB]) is considered safe and would not result in any construction vibration damage. The City of San José has a vibration limit of 0.20 in/sec PPV for buildings of normal conventional construction (General Plan Policy EC-2.3). The vibration produced by construction equipment is illustrated in Table 9, *Typical Vibration Levels for Construction Equipment*.

Table 9
Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 25 feet (inches/second)[1]	Approximate peak particle velocity at 50 feet (inches/second)[2]	Approximate peak particle velocity at 100 feet (inches/second)[2]
Large bulldozer	0.089	0.031	0.011
Loaded trucks	0.076	0.027	0.010
Small bulldozer	0.003	0.001	0.000
Jackhammer	0.035	0.012	0.004

Notes:
1 – Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006. Table 12-2.
2 – Calculated using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA *Transit Noise and Vibration Impact Assessment Guidelines*
D = the distance from the equipment to the receiver

Groundborne vibration decreases rapidly with distance. As indicated in Table 9, based on the FTA data, vibration velocities from typical heavy construction equipment operation that would be used during project construction range from 0.003 to 0089 inch-per-second peak particle velocity (PPV) at 25 feet from the source of activity. As such, the residences located 25 feet east of the project site would not be exposed to vibration levels exceeding the City's 0.2 in/sec PPV significance threshold for vibration. Therefore, vibration impacts associated with pile driving and other construction equipment used for the project would be less than significant.

LONG-TERM OPERATIONAL IMPACTS

The project proposes a mixed-use building with ground floor retail, 285 condominiums, and a four-level underground parking garage that would not generate ground-borne vibration that could be felt at surrounding uses. The proposed project would not involve railroads or substantial heavy truck operations, and therefore would not result in vibration impacts at surrounding uses. As such, no impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: *Less Than Significant Impact.*

NOI-3

- ***FOR A PROJECT LOCATED WITHIN AN AIRPORT LAND USE PLAN OR, WHERE SUCH A PLAN HAS NOT BEEN ADOPTED, WITHIN TWO MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT, EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS?***

- ***FOR A PROJECT WITHIN THE VICINITY OF A PRIVATE AIRSTRIP, EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS?***

Level of Significance Before Mitigation: *No Impact.*

The closest airport is the Norman Y. Mineta San José Airport, which is located 2.4 miles northwest of the project site. According to the General Plan EIR, the project site is located within the 2027 60 dB CNEL airport noise contour and is not within the City's projected aircraft noise impact area. As such, aircraft noise levels would not exceed the City's 60 dB noise standard for residential uses at the project site. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels. No impact would occur in this regard.

***Mitigation Measures*:** No mitigation measures are required.

Level of Significance After Mitigation: *No Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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12. U.S. Department of Housing and Urban Development, *The Noise Guidebook*, undated.

13. U.S. Environmental Protection Agency, *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*, October 1979 (revised July 1981).

14. U.S. Environmental Protection Agency, *Protective Noise Levels*, November 1978.

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6.3 SOFTWARE/WEBSITES

Google Earth, 2018.

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APPENDIX A: NOISE DATA

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Site Number: 1			
Recorded By: Adam Foster			
Job Number: 161396			
Date: 1/10/18			
Time: 1:28 p.m.			
Location: Southeast corner of S. Second Street & E. Reed Street intersection (midblock).			
Source of Peak Noise: Airplanes and adjacent vehicle traffic (including some freeway noise).			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
66.9	59.9	76.0	88.6

Equipment					
Category	Type	Vendor	Model	Serial No.	Note
Sound	Sound Level Meter	SoundExpert	LxT	03788	
	Calibrator	Larson Davis	CAL 200	11166	
Weather Data					
Est.	Duration: 10 minutes		Sky: Cloudy		
	Note: dBA Offset = 0.01		Sensor Height (ft): 5 ft		
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)		Barometer Pressure (inches)	
	6.0	56		30.16	

Photo of Measurement Location

Summary

File Name on Meter	AF___.003
File Name on PC	SLM_0003788_AF____003.01.ldbin
Serial Number	0003788
Model	SoundExpert® LxT
Firmware Version	2.301
User	
Location	
Job Description	
Note	

Measurement

Description	AF _ademy Project
Start	2018-01-10 13:28:42
Stop	2018-01-10 13:38:42
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2018-01-10 12:58:50
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	120.3 dB

	A	**C**	**Z**
Under Range Peak	**76.6**	73.6	78.6 dB
Under Range Limit	**25.3**	24.8	31.3 dB
Noise Floor	15.9	15.7	21.4 dB

Results

LA_{Seq}	66.9 dB	
LASE	94.6 dB	
EAS	323.667 µPa²h	
$LA_{Speak\ (max)}$	2018-01-10 13:30:52	88.6 dB
LA_{Smax}	2018-01-10 13:32:19	76.0 dB
LA_{Smin}	2018-01-10 13:28:42	59.9 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{Speak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{Speak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{Speak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-23:00**	**LNight 23:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-23:00**
	66.9	66.9	-99.9	66.9	66.9	-99.9

LC_{Seq}	75.6 dB
LA_{Seq}	66.9 dB
LC_{Seq} - LA_{Seq}	8.8 dB
LA_{Ieq}	68.4 dB
LA_{eq}	66.9 dB
LA_{Ieq} - LA_{eq}	1.6 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	66.9					
$L_{S(max)}$	76.0	2018/01/10 13:32:19				
$L_{S(min)}$	59.9	2018/01/10 13:28:42				
$L_{Peak(max)}$	88.6	2018/01/10 13:30:52				

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

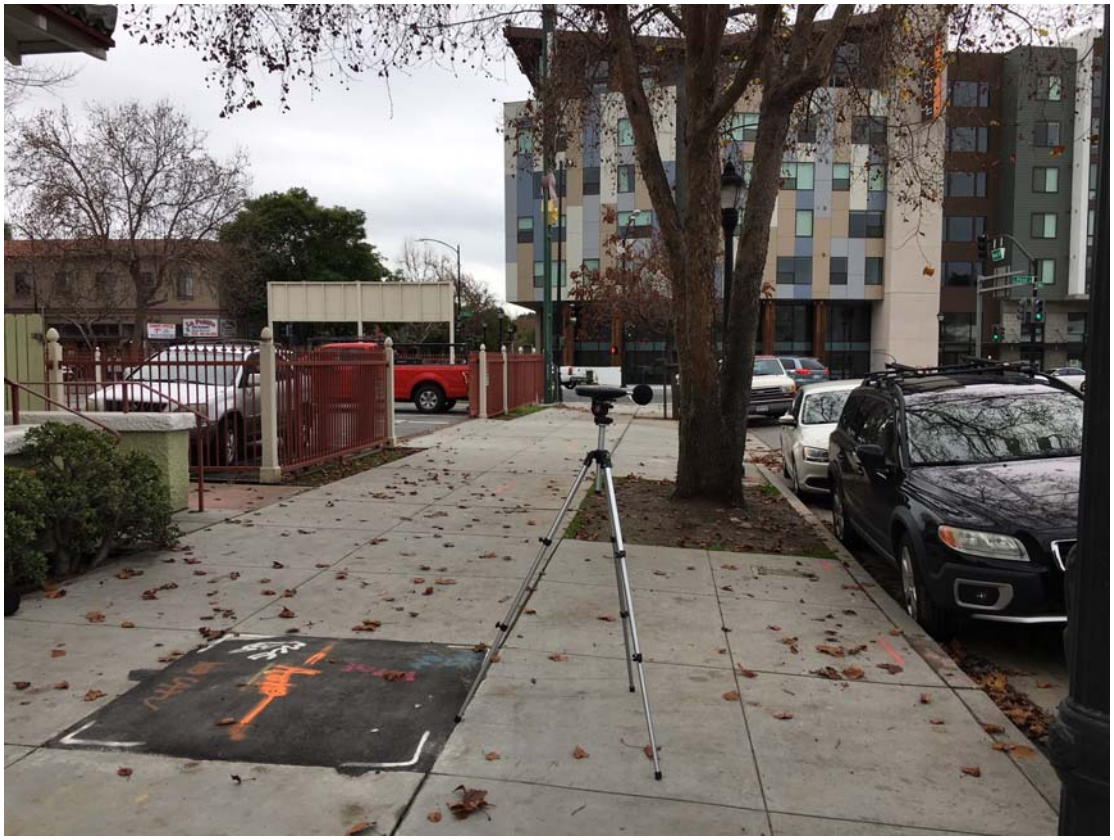
Statistics

LAS5.00	72.4 dB
LAS10.00	70.7 dB
LAS33.30	65.7 dB
LAS50.00	64.1 dB
LAS66.60	63.4 dB
LAS90.00	62.6 dB

Site Number: 2			
Recorded By: Adam Foster			
Job Number: 161396			
Date: 1/10/18			
Time: 1:16 p.m.			
Location: Southeast corner of S. First Street & E. Reed Street intersection.			
Source of Peak Noise: Airplanes, adjacent vehicle traffic, and construction vehicle backup beeper across the street.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
68.1	59.4	81.6	96.4

Equipment					
Category	Type	Vendor	Model	Serial No.	Note
Sound	Sound Level Meter	SoundExpert	LxT	03788	
	Calibrator	Larson Davis	CAL 200	11166	
Weather Data					
Est.	Duration: 10 minutes		Sky: Cloudy		
	Note: dBA Offset = 0.01		Sensor Height (ft): 5 ft		
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)		Barometer Pressure (inches)	
	5.7	56		30.16	

Photo of Measurement Location



Summary

File Name on Meter	AF___.002
File Name on PC	SLM_0003788_AF____002.01.ldbin
Serial Number	0003788
Model	SoundExpert® LxT
Firmware Version	2.301
User	
Location	
Job Description	
Note	

Measurement

Description	AF _ademy Project
Start	2018-01-10 13:16:34
Stop	2018-01-10 13:26:34
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2018-01-10 12:58:50
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	120.3 dB

	A	C	Z
Under Range Peak	**76.6**	73.6	78.6 dB
Under Range Limit	**25.3**	24.8	31.3 dB
Noise Floor	15.9	15.7	21.4 dB

Results

L_{ASeq}	68.1 dB	
LASE	95.9 dB	
EAS	429.961 µPa²h	
$L_{ASpeak\ (max)}$	2018-01-10 13:24:54	96.4 dB
L_{ASmax}	2018-01-10 13:24:54	81.6 dB
L_{ASmin}	2018-01-10 13:17:21	59.4 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{ASpeak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{ASpeak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{ASpeak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-23:00**	**LNight 23:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-23:00**
	68.1	68.1	-99.9	68.1	68.1	-99.9

L_{CSeq}	76.9 dB
L_{ASeq}	68.1 dB
L_{CSeq} - L_{ASeq}	8.8 dB
L_{AIeq}	69.9 dB
L_{Aeq}	68.1 dB
L_{AIeq} - L_{Aeq}	1.8 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	68.1					
$L_{S(max)}$	81.6	2018/01/10 13:24:54				
$L_{S(min)}$	59.4	2018/01/10 13:17:21				
$L_{Peak(max)}$	96.4	2018/01/10 13:24:54				

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	72.6 dB
LAS10.00	70.8 dB
LAS33.30	66.8 dB
LAS50.00	65.5 dB
LAS66.60	64.4 dB
LAS90.00	62.7 dB

Site Number: 3			
Recorded By: Adam Foster			
Job Number: 161396			
Date: 1/10/18			
Time: 1:44 p.m.			
Location: West of the intersection of S. First Street and W. Reed Street.			
Source of Peak Noise: Airplanes and freeway traffic.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
69.2	64.4	79.6	96.5

Equipment					
Category	Type	Vendor	Model	Serial No.	Note
Sound	Sound Level Meter	SoundExpert	LxT	03788	
	Calibrator	Larson Davis	CAL 200	11166	

Weather Data			
Est.	Duration: 10 minutes		Sky: Cloudy
	Note: dBA Offset = 0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	6.2	56	30.16

Photo of Measurement Location

Summary

File Name on Meter	AF___.004
File Name on PC	SLM_0003788_AF____004.01.ldbin
Serial Number	0003788
Model	SoundExpert® LxT
Firmware Version	2.301
User	
Location	
Job Description	
Note	

Measurement

Description	AF _ademy Project
Start	2018-01-10 13:44:14
Stop	2018-01-10 13:54:14
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2018-01-10 12:58:50
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	120.3 dB

	A	**C**	**Z**
Under Range Peak	**76.6**	73.6	78.6 dB
Under Range Limit	**25.3**	24.8	31.3 dB
Noise Floor	15.9	15.7	21.4 dB

Results

LA_{Seq}	69.2 dB	
LASE	96.9 dB	
EAS	548.993 µPa²h	
$LAS_{peak\ (max)}$	2018-01-10 13:45:39	96.5 dB
LAS_{max}	2018-01-10 13:44:20	79.6 dB
LAS_{min}	2018-01-10 13:53:25	64.4 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-23:00**	**LNight 23:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-23:00**
	69.2	69.2	-99.9	69.2	69.2	-99.9

LC_{Seq}	76.0 dB
LA_{Seq}	69.2 dB
LC_{Seq} - LA_{Seq}	6.9 dB
LAI_{eq}	70.7 dB
LA_{eq}	69.1 dB
LAI_{eq} - LA_{eq}	1.6 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	69.1					
$L_{S(max)}$	79.6	2018/01/10 13:44:20				
$L_{S(min)}$	64.4	2018/01/10 13:53:25				
$L_{Peak(max)}$	96.5	2018/01/10 13:45:39				

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	73.9 dB
LAS10.00	71.5 dB
LAS33.30	68.1 dB
LAS50.00	67.0 dB
LAS66.60	66.4 dB
LAS90.00	65.5 dB

Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Market Street/1st Street		
Road Segment:	North of Reed Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	18,463
Peak Hour Traffic:	**1846.3**
Vehicle Speed:	30
Centerline Separation:	26

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

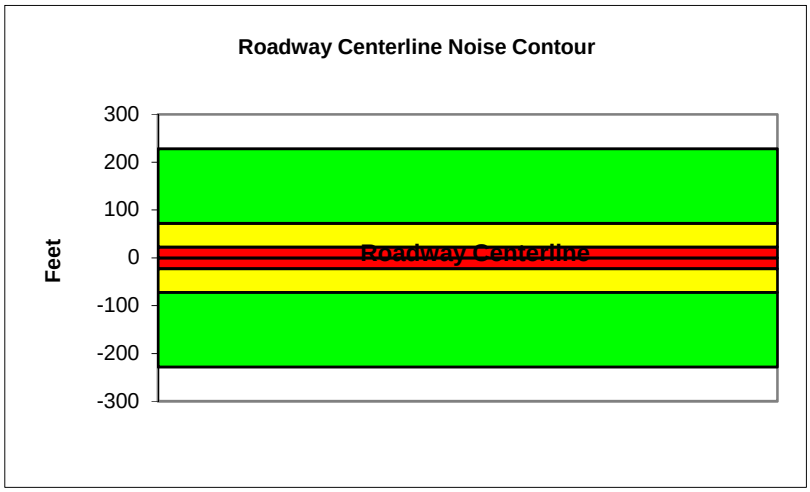
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.7	59.5	57.7	51.6	60.3	60.9
Medium Trucks:	61.3	53.3	46.9	45.3	53.8	54.0
Heavy Trucks:	67.0	55.0	46.0	47.2	57.3	57.4
Vehicle Noise:	**69.5**	**62.0**	**58.4**	**54.1**	**62.7**	**63.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	228
65 dBA	72
70 dBA	23
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Market Street/1st Street		
Road Segment:	South of Reed Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	25,950
Peak Hour Traffic:	**2595**
Vehicle Speed:	35
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

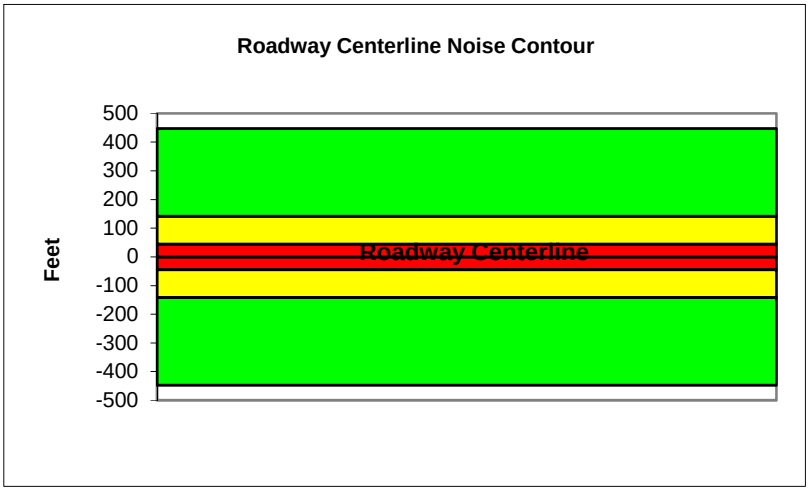
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.2	62.9	61.2	55.1	63.7	64.3
Medium Trucks:	63.9	55.8	49.4	47.9	56.3	56.6
Heavy Trucks:	69.1	57.2	48.1	49.3	59.2	59.4
Vehicle Noise:	**71.5**	**64.9**	**61.7**	**57.0**	**65.6**	**66.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	447
65 dBA	142
70 dBA	45
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Reed Street		
Road Segment:	East of Market Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	7,107
Peak Hour Traffic:	**710.7**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

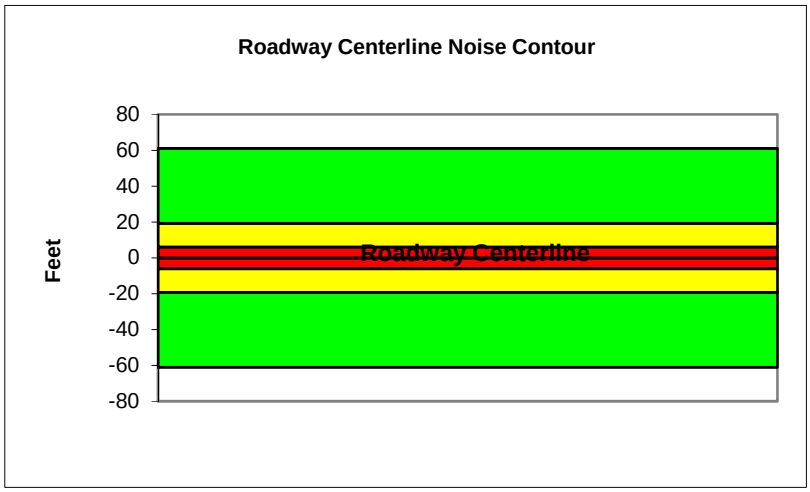
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.3	53.1	51.3	45.2	53.9	54.5
Medium Trucks:	56.0	47.9	41.5	39.9	48.4	48.7
Heavy Trucks:	62.1	50.2	41.1	42.4	52.7	52.9
Vehicle Noise:	**64.8**	**56.4**	**52.3**	**48.5**	**57.0**	**57.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	61
65 dBA	19
70 dBA	6
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Reed Street		
Road Segment:	East of Market Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	6,244
Peak Hour Traffic:	**624.4**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

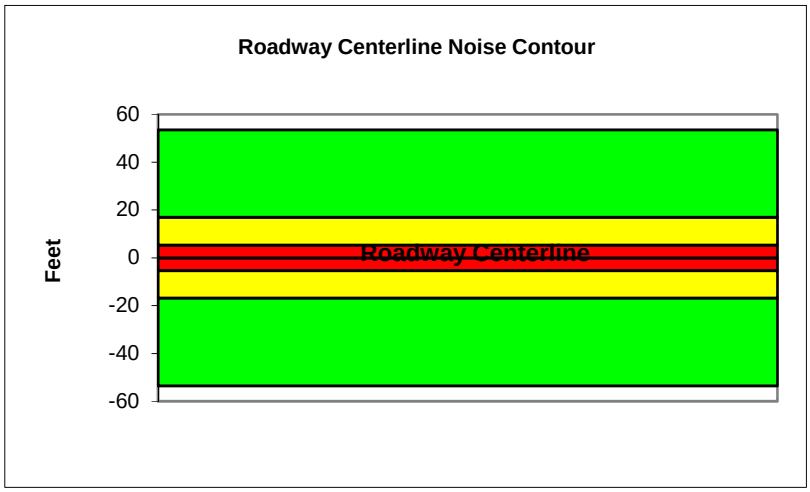
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.8	52.5	50.8	44.7	53.3	53.9
Medium Trucks:	55.4	47.3	41.0	39.4	47.9	48.1
Heavy Trucks:	61.6	49.6	40.6	41.8	52.2	52.3
Vehicle Noise:	**64.2**	**55.8**	**51.7**	**47.9**	**56.4**	**56.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	54
65 dBA	17
70 dBA	5
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing Plus Project
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Market Street/1st Street		
Road Segment:	North of Reed Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	19,001
Peak Hour Traffic:	**1900.1**
Vehicle Speed:	30
Centerline Separation:	26

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

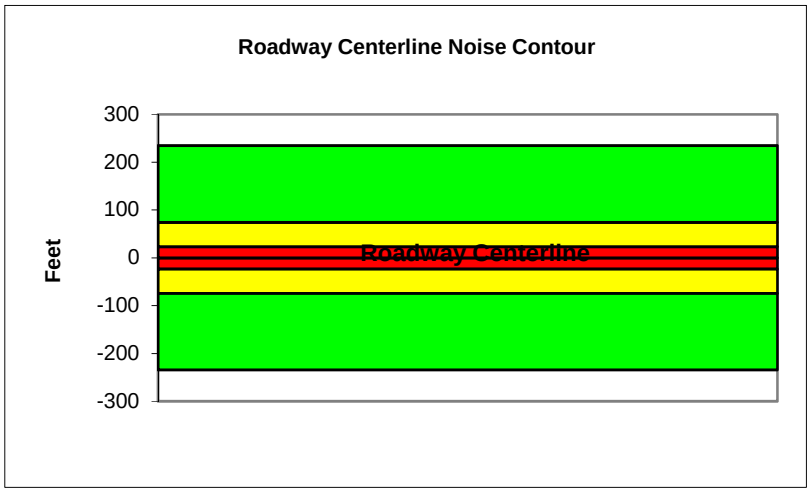
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.8	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	61.4	53.4	47.0	45.4	53.9	54.1
Heavy Trucks:	67.1	55.2	46.1	47.3	57.4	57.6
Vehicle Noise:	**69.6**	**62.1**	**58.6**	**54.2**	**62.8**	**63.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	235
65 dBA	74
70 dBA	23
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing Plus Project
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Market Street/1st Street		
Road Segment:	South of Reed Street		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	26,994
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**2699.4**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	35
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	24
Barrier Far lane CL Dist:	**0**	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	**0**	**FLEET MIX**	
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

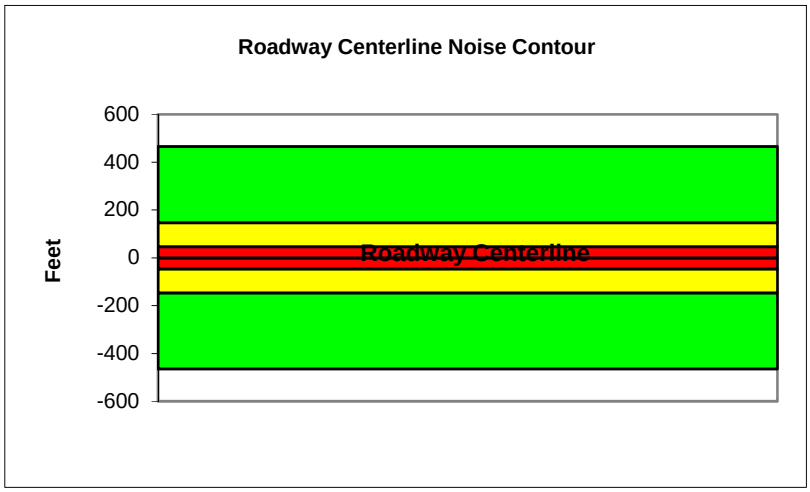
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.3	63.1	61.3	55.2	63.9	64.5
Medium Trucks:	64.0	56.0	49.6	48.0	56.5	56.7
Heavy Trucks:	69.3	57.3	48.3	49.5	59.4	59.5
Vehicle Noise:	**71.7**	**65.1**	**61.9**	**57.2**	**65.8**	**66.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	465
65 dBA	147
70 dBA	47
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing Plus Project
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Reed Street		
Road Segment:	East of Market Street		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	8,026
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**802.6**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	25
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	24
Barrier Far lane CL Dist:	**0**	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	**0**	**FLEET MIX**	
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

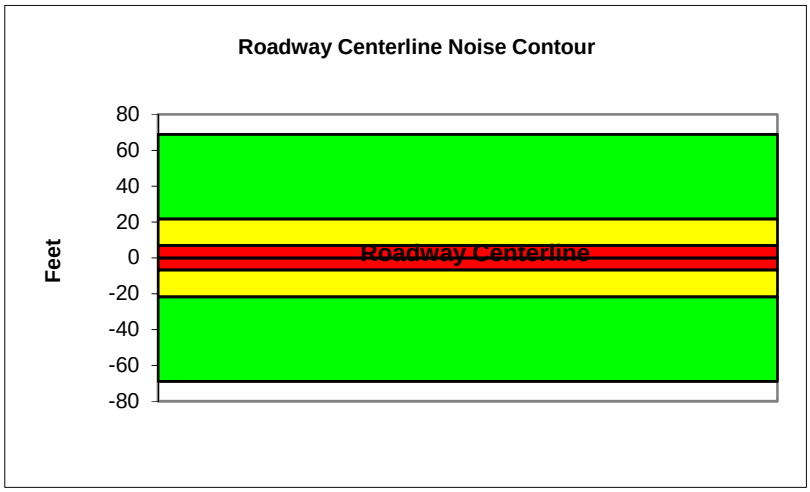
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.9	53.6	51.8	45.8	54.4	55.0
Medium Trucks:	56.5	48.4	42.1	40.5	49.0	49.2
Heavy Trucks:	62.7	50.7	41.7	42.9	53.3	53.4
Vehicle Noise:	**65.3**	**56.9**	**52.8**	**49.0**	**57.5**	**57.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	69
65 dBA	22
70 dBA	7
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Garden Gate Tower	Scenario:	Existing Plus Project
Analyst:	Ryan Chiene	Job #:	161936
Roadway:	Reed Street		
Road Segment:	East of Market Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	6,344
Peak Hour Traffic:	**634.4**
Vehicle Speed:	25
Centerline Separation:	24

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.8	52.6	50.8	44.7	53.4	54.0
Medium Trucks:	55.5	47.4	41.0	39.5	47.9	48.2
Heavy Trucks:	61.6	49.7	40.6	41.9	52.2	52.4
Vehicle Noise:	**64.3**	**55.9**	**51.8**	**48.0**	**56.5**	**56.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	54
65 dBA	17
70 dBA	5
Mitigated	
60 dBA	
65 dBA	
70 dBA