SAN BRUNO HYUNDAI & GENESIS AUTOMOBILE DEALERSHIPS NOISE AND VIBRATION ASSESSMENT

San Bruno, California

February 2, 2023

Prepared for:

Matthew Moore
Project Manager
David J. Powers & Associates, Inc.
1736 Franklin Street, Suite 400
Oakland, CA 94612

Prepared by:

Carrie J. Janello
Michael S. Thill

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Job No.: 21-060

INTRODUCTION

The project proposes the construction of a three-story above-ground building that will house automobile sales and service areas for Hyundai and Genesis vehicles at 1010 Admiral Court in San Bruno, California. The building would include space for employee and customer parking, vehicle inventory storage, and two below-grade parking levels for additional parking. Up to 70 employees are anticipated for auto sales and service uses. The approximately 1.66-acre project site is currently undeveloped and relatively flat.

This report evaluates the project's potential to result in significant impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into three sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses ambient noise conditions in the project vicinity; 2) the Plan Consistency Analysis section discusses noise and land use compatibility utilizing policies in the City's General Plan; and 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents mitigation measures, where necessary, to mitigate project impacts to a less-than-significant level.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the

variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes

for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}. At a L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn} of 60 to 70 dBA. Between a L_{dn} of 70 to 80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, April 2020.

Regulatory Background – Noise

This section describes the relevant guidelines, policies, and standards established by State Agencies, San Mateo County, and the City of San Bruno. The State CEQA Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

State of California

State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(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 groundborne vibration or groundborne 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, if the project would expose people residing or working in the project area to excessive noise levels.

2019 California Building Cal Green Code. The State of California established exterior sound transmission control standards for new non-residential buildings as set forth in the 2019 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). The sections that pertain to this project are as follows:

> **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 when the building falls within the 65 dBA L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the local general plan noise element.
>
> **5.507.4.2 Performance method.** For buildings located, as defined by Section 5.507.4.1, wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\,(1\text{-}hr)}$) of 50 dBA in occupied areas during any hour of operation.

The performance method, which establishes the acceptable interior noise level, is the method typically used when applying these standards.

San Mateo County

Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport, November 2012. Noise compatibility policies established in this document were designed to protect the public health, safety, and welfare by minimizing the exposure of residents and occupants of future noise-sensitive development to excessive noise and to protect the public interest in providing for the orderly development of SFO by ensuring that new development in the Airport environs complies with all requirements necessary to ensure compatibility with aircraft noise in the area. The intent is to avoid the introduction of new incompatible land uses into the Airport's "noise impact area" so that the Airport will continue to be in compliance with the State Noise Standards for airports (California Code of Regulations, Title 21, Sections 5012 and 5014).[1] The following noise compatibility policies (NP) shall apply to the ALUCP and are applicable to this project:

NP-1: Noise Compatibility Zones. For the purposes of this ALUCP, the projected 2020 CNEL noise contour map from the Draft Environmental Assessment for the Proposed Runway Safety Area Program shall define the boundaries within which noise compatibility policies described in this Section shall apply.[2] Exhibit IV-5 depicts the noise compatibility zones. More detail is provided on Exhibit IV-6. The zones are defined by the CNEL 65, 70 and 75 dB contours.

1 In 2002, the San Mateo County Board of Supervisors declared that the Airport had eliminated its "noise impact area," as defined under state law -- California Code of Regulations, Title 21, Sections 5012 and 5014.

2 URS Corporation and BridgeNet International. Draft Environmental Assessment, Proposed Runway Safety Area Program, San Francisco International Airport, June 2011.

NP-2: Airport Noise/Land Use Compatibility Criteria. The compatibility of proposed land uses located in the Airport noise compatibility zones shall be determined according to the noise/land use compatibility criteria shown in Table IV-1. The criteria indicate the maximum acceptable airport noise levels, described in terms of Community Noise Equivalent Level (CNEL), for the indicated land uses. The compatibility criteria indicate whether a proposed land use is "compatible," "conditionally compatible," or "not compatible" within each zone, designated by the identified CNEL ranges.

- "Compatible" means that the proposed land use is compatible with the CNEL level indicated in the table and may be permitted without any special requirements related to the attenuation of aircraft noise.

- "Conditionally compatible" means that the proposed land use is compatible if the conditions described in Table IV-1 are met.

- "Not compatible" means that the proposed land use is incompatible with aircraft noise at the indicated CNEL level.

NP-3: Grant of Avigation Easement. Any action that would either permit or result in the development or construction of a land use considered to be conditionally compatible with aircraft noise of CNEL 65 dB or greater shall be subject to this easement requirement. The determination of conditional compatibility shall be based on the criteria presented in Table IV-1 "Noise/Land Use Compatibility Criteria."

The San Mateo County Airport Land Use Commission (the C/CAG Board) deems it necessary to: (1) ensure the unimpeded use of airspace in the vicinity of SFO; (2) to ensure that new noise-sensitive land uses within the CNEL 65 dB contour are made compatible with aircraft noise, in accordance with California Code of Regulations, Title 21, Section 5014; and (3) to provide notice to owners of real property near the Airport of the proximity to SFO and of the potential impacts that could occur on the property from airport/aircraft operations. Thus, C/CAG shall condition its approval of proposed development upon the owner of the subject property granting an avigation easement to the City and County of San Francisco, as the proprietor of SFO. The local government with the ultimate permitting and approval authority over the proposed development shall ensure that this condition is implemented prior to final approval of the proposed development. If the approval action for the proposed development includes construction of a building(s) and/or other structures, the local permitting authority shall require the grant of an avigation easement to the City and County of San Francisco prior to issuance of a building permit(s) for the proposed building or structure. If the proposed development is not built, then, upon notice by the local permitting authority, SFO shall record a notice of termination of the avigation easement.

The avigation easement to be used in fulfilling this condition is presented in Appendix G.

NP-4: Residential Uses Within CNEL 70 dB Contour. As described in Table IV-1, residential uses are not compatible in areas exposed to noise above CNEL 70 dB and typically should not be allowed in these high noise areas.

NP-4.1: Situations Where Residential Use Is Conditionally Compatible. Residential uses are considered conditionally compatible in areas exposed to noise above CNEL 70 dB only if the proposed use is on a lot of record zoned exclusively for residential use as of the effective date of the ALUCP. In such a case, the residential use must be sound-insulated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources. The property owner also shall grant an avigation easement to the City and County of San Francisco in accordance with Policy NP-3 prior to issuance of a building permit for the proposed building or structure.

Table IV-1 Noise/Land Use Compatibility Criteria

	COMMUNITY NOISE EQUIVALENT LEVEL (CNEL)			
LAND USE	**BELOW 65 dB**	**65-70 dB**	**70-75 dB**	**75 dB AND OVER**
Residential				
Residential, single family detached	Y	C	N *(a)*	N
Residential, multi-family and single family attached	Y	C	N *(a)*	N
Transient lodgings	Y	C	C	N
Public/Institutional				
Public and Private Schools	Y	C	N	N
Hospitals and nursing homes	Y	C	N	N
Places of public assembly, including places of worship	Y	C	N	N
Auditoriums, and concert halls	Y	C	C	N
Libraries	Y	C	C	N
Outdoor music shells, amphitheaters	Y	N	N	N
Recreational				
Outdoor sports arenas and spectator sports	Y	Y	Y	N
Nature exhibits and zoos	Y	Y	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N
Golf courses, riding stables, and water recreation	Y	Y	Y	Y
Commercial				
Offices, business and professional, general retail	Y	Y	Y	Y
Wholesale; retail building materials, hardware, farm equipment	Y	Y	Y	Y
Industrial and Production				
Manufacturing	Y	Y	Y	Y
Utilities	Y	Y	Y	Y
Agriculture and forestry	Y	Y *(b)*	Y *(c)*	Y *(c)*
Mining and fishing, resource production and extraction	Y	Y	Y	Y

Notes:

CNEL = Community Noise Equivalent Level, in A-weighted decibels.

Y (Yes) = Land use and related structures compatible without restrictions.

C (conditionally compatible) = Land use and related structures are permitted, provided that sound insulation is provided to reduce interior noise levels from exterior sources to CNEL 45 dB or lower and that an avigation easement is granted to the City and County of San Francisco as operator of SFO. See Policy NP-3.

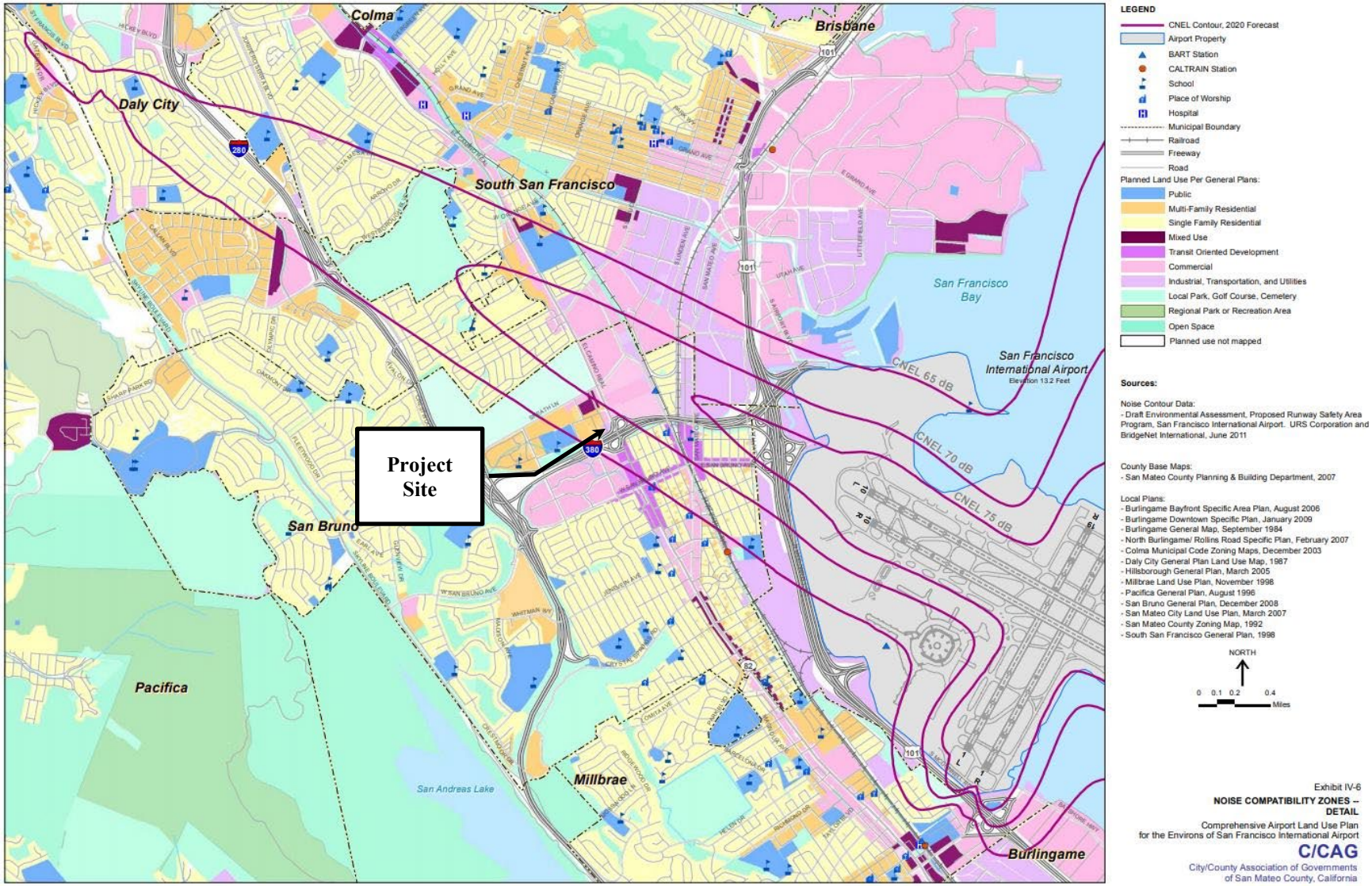
N (No) = Land use and related structures are not compatible..

(a) Use is conditionally compatible only on an existing lot of record zoned only for residential use as of the effective date of the ALUCP. Use must be sound-insulated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources. The property owners shall grant an avigation easement to the City and County of San Francisco prior to issuance of a building permit for the proposed building or structure. If the proposed development is not built, then, upon notice by the local permitting authority, SFO shall record a notice of termination of the avigation easement.

(b) Residential buildings must be sound-insulated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources.

(c) Accessory dwelling units are not compatible.

SOURCES: Jacobs Consultancy Team 2010. Based on State of California General Plan Guidelines for noise elements of general plans; California Code of Regulations, Title 21, Division 2.5, Chapter 6, Section 5006; and 14 CFR Part 150, Appendix A, Table 1.
PREPARED BY; Ricondo & Associates, Inc., June 2012.



Source: Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport, November 2012, accessed via https://ccag.ca.gov/wp-content/uploads/2014/10/Consolidated_CCAG_ALUCP_November-20121.pdf June 2021.

City of San Bruno

City of San Bruno General Plan. The City of San Bruno's General Plan includes a Noise section within the Health and Safety Element which provides guidelines to achieve the goal of maintaining an acceptable community noise level. The following general plan policies are applicable to the project:

HS-32 Encourage developers to mitigate ambient noise levels adjacent to major noise sources by incorporating acoustical site planning into their projects. Utilize the City's Building Code to implement mitigation measures, such as:

- Incorporating buffers and/or landscaped berms along high-noise roadways or railways;
- Incorporating traffic calming measures and alternative intersection design within and/or adjacent to the project;
- Using reduced-noise pavement (rubberized asphalt); and
- Incorporating state-of-the-art structural sound attenuation measures.

HS-33 Prevent the placement of new noise-sensitive uses unless adequate mitigation is provided. Establish insulation requirements as mitigation measures for all development, per the standards in Table 7-1.

HS-34 Discourage noise-sensitive uses such as hospitals, schools, and rest homes from locating in areas with high noise levels. Conversely, discourage new uses likely to produce high levels of noise from locating in areas where noise-sensitive uses would be impacted.

HS-35 Require developers to comply with relevant noise insulation standards contained in Title 24 of the California Code of Regulations (Part 2, Appendix Chapter 12A).

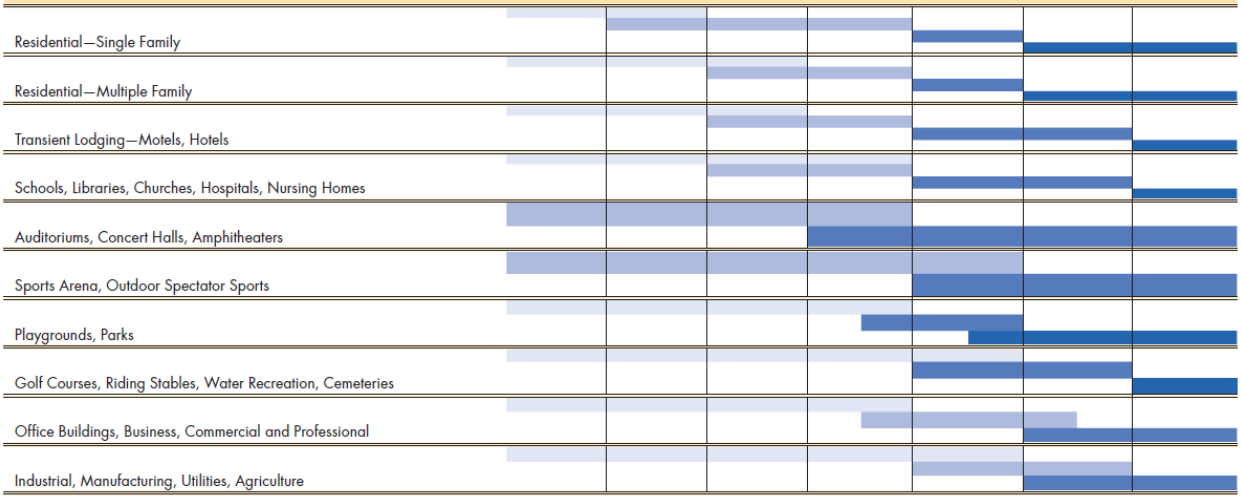
HS-38 Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation rate as noise travels from the source to the receptor.

TABLE 7-1: San Mateo County Comprehensive Airport Land Use Plan Noise/Land Use Compatibility Standards

LAND USE	GENERAL LAND USE CRITERIA, CNELA		
	COMPATIBLE *No special noise insulation requirements for new construction*	**CONDITIONALLY COMPATIBLE** *New development should be undertaken only after analysis and including needed noise insulation features in design*	**INCOMPATIBLE** *New construction should not be undertaken unless related to airport activities or services. Special noise insulation features should be included in construction*
RESIDENTIAL: single- and multi-family, mobile homes, schools, libraries, churches, hospitals, nursing homes, and auditoriums	Less than 65	65 to 70	More than 70
COMMERCIAL: retail, restaurants, office buildings, hotels, motels, movie theaters, sports arenas, playgrounds, cemeteries, and golf courses	Less than 70	70 to 80	More than 80
INDUSTRIAL: manufacturing, transportation, communications, and utilities	Less than 75	75 to 85	More than 85
OPEN SPACE: agriculture, mining, fishing	Less than 75	NA	More than 75

Source: San Mateo County Airport Land Use Commission, San Mateo County Comprehensive Airport Land Use Plan, December 1996.

TABLE 7-2: Land Use Compatibility For Community Noise Environments



INTERPRETATION

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	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable	New construction or development should not be undertaken.

City of San Bruno Municipal Code. San Bruno's Noise Ordinance is contained in Title 6 of the San Bruno Municipal Code. The ordinance places limits on noise levels in residential zones, limits construction activity noise levels and hours near residential zones, establishes machinery noise level limits, and addresses amplified sounds. The following ordinances are applicable to the project:

> 6.16.030 Ambient noise level limits. Where the ambient noise level is less than designated in this section, the respective noise level in this section shall govern.
>
> Sound Level A, decibels
>
> Residential zone, time ten p.m. to seven a.m., forty-five decibels; seven a.m. to ten p.m., sixty decibels. (Ord. 1354 § 1; prior code § 16-4.3)
>
> 6.16.050 Noise levels exceeding ambient base level. Any noise level exceeding the zone ambient base level at the property plane of any property, or exceeding the zone ambient base level on any adjacent residential area zone line or at any place of other property (or, if a condominium or apartment house, within any adjoining apartment) by more than ten decibels shall be deemed to be prima facie evidence of a violation of the provisions of this chapter. However, during the period of seven a.m. to ten p.m. the ambient base level may be exceeded by twenty decibels for a period not to exceed thirty minutes during any twenty-four-hour period.

6.16.060 Machinery noise levels. No person shall operate any machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property plane of any property to exceed the ambient base noise level by more than ten decibels. However, during the period of seven a.m. to ten p.m. the ambient noise level may be exceeded by twenty decibels for a period not to exceed thirty minutes during any twenty-four-hour period.

6.16.070 Construction of buildings and projects. No person shall, within any residential zone, or within a radius of five hundred feet therefrom, operate equipment or perform any outside construction or repair work on any building, structure, or other project, or operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction-type device which shall exceed, between the hours of seven a.m. and ten p.m., a noise level of eighty-five decibels as measured at one hundred feet, or exceed between the hours of ten p.m. and seven a.m. a noise level of sixty decibels as measured at one hundred feet, unless such person shall have first obtained a permit therefor from the director of public works. No permit shall be required to perform emergency work.

Regulatory Background – Vibration

California Department of Transportation. Caltrans identifies a vibration threshold of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.25 in/sec PPV for historic and some old buildings (see Table 3).

Existing Noise Environment

The project site is located at 1010 Admiral Court in the City of San Bruno, California. The project site is bound to the east by El Camino Real and to the south by I-380. To the north are existing commercial retail uses and to the west and northwest are existing residential buildings. South of I-380 is a hotel, a hospital building, and commercial and office uses. East of El Camino Real is a shopping center, and single-family residences, commercial uses, and a hotel are located in the southeastern corner of the I-380 interchange at El Camino Real.

The existing noise environment at the site results primarily from traffic noise along I-380. Traffic along El Camino Real and aircraft associated with San Francisco International Airport also contribute to the noise environment.

A noise monitoring survey consisting of one long-term (LT-1) and two short-term (ST-1 and ST-2) noise measurements was made at the site between Wednesday, August 17, 2022, and Friday, August 19, 2022. All measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was made in the southwest corner of the project site where Commodore Drive turns northeast. Noise levels at LT-1 are dominated by traffic along I-380 and would be representative of the existing noise environment at the residential uses west of the project site. LT-1 was made approximately 110 feet north of the centerline of the nearest through lane along I-380, and hourly average noise levels typically ranged from 68 to 72 dBA L_{eq} during

daytime hours (7:00 a.m. and 10:00 p.m.) and from 62 to 71 dBA L_{eq} during nighttime hours (10:00 p.m. and 7:00 a.m.). The day-night average noise level on Thursday, August 18, 2022, was 75 dBA L_{dn}. The daily trend in noise levels at LT-1 is shown in Figures A1 through A3 of Appendix A.

Short-term noise measurements were made on Wednesday, August 17, 2022, between 11:00 a.m. and 11:30 a.m. in 10-minute intervals. Results of the measurements are summarized in Table 4.

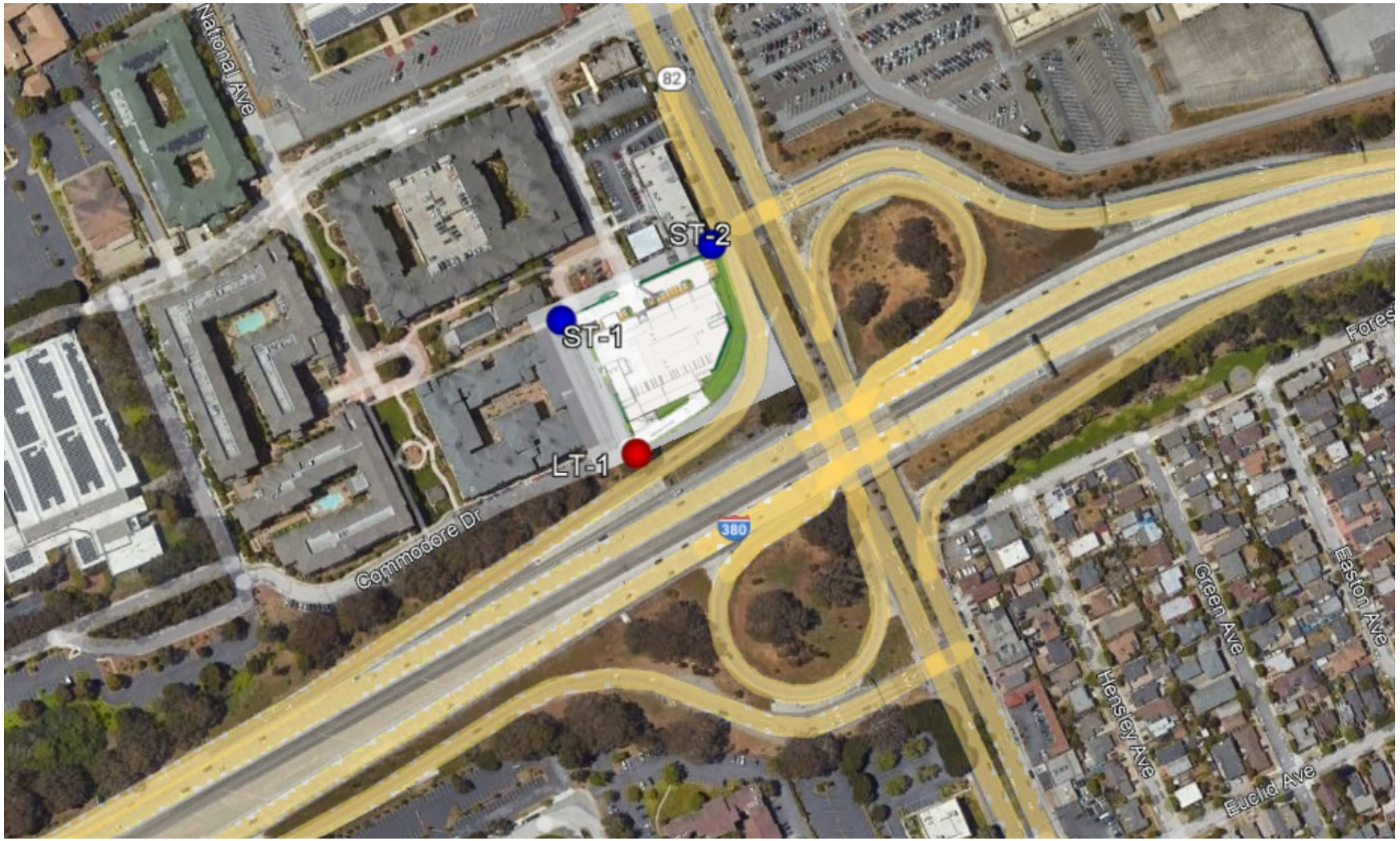
ST-1 was made near the northwest corner of the project site, approximately 15 feet from the centerline of Commodore Drive. Traffic along I-380 was the primary noise source at this location. Traffic noise levels from I-380 ranged from 60 to 64 dBA at ST-1. Local traffic along Commodore Drive included six passenger cars in a 10-minute period, with noise levels ranging from 59 to 65 dBA. Jets flying over the project site generated noise levels ranging from 66 to 68 dBA. The 10-minute L_{eq} measured at ST-1 was 63 dBA.

ST-2 was along El Camino Real and was set back approximately 85 feet from the centerline. The primary noise source at the ST-2 measurement location was traffic along El Camion Real, which included heavy trucks (70 to 79 dBA), passenger cars (62 to 73 dBA), and buses (70 to 75 dBA). Traffic from I-380 generated noise levels of 62 to 65 dBA at ST-2. The 10-minute L_{eq} measured at ST-2 was 72 dBA.

TABLE 4 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	Date, Time	Measured Noise Level, dBA					
		L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: ~15 feet from the centerline of Commodore Drive	8/17/2022, 11:00-11:10	68	67	64	62	61	63
ST-2: ~85 feet from the centerline of El Camino Real	8/17/2022, 11:20-11:30	79	78	75	71	64	72

FIGURE 1 Aerial Image of the Project Site and Surrounding Area with Long- and Short-Term Measurement Locations Identified



Source: Google Earth, 2022.

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

The Cal Green Code standards specify an interior noise environment attributable to exterior sources not to exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas of nonresidential uses during any hour of operation.

The future noise environment at the site would continue to result primarily from vehicular traffic along I-380 and El Camino Real. The traffic study completed for the proposed project includes existing traffic volumes and peak hour trips generated by the proposed project. When added to the existing volumes, the project would not result in a measurable increase over existing conditions due to the loud ambient noise environment. Future traffic noise levels are anticipated to increase by about 1 dBA L_{dn} above existing conditions, assuming a standard rate of growth in the area (1% to 2% per year) over the next 15 to 20 years.

Future Interior Noise Environment

The nearest building façades facing I-380 are 155 to 170 feet from the centerline of the nearest through lane. At these distances, daytime hourly average noise levels at the proposed building exteriors nearest to I-380 would range from 67 to 71 dBA L_{eq}, with day-night average noise levels up to 74 dBA L_{dn}.

Standard construction materials for nonresidential uses would provide about 25 dBA of noise reduction in interior spaces. The inclusion of adequate forced-air mechanical ventilation systems is normally required so that windows may be kept closed at the occupant's discretion and would provide an additional 5 dBA reduction. The standard construction materials in combination with forced-air mechanical ventilation would satisfy the daytime threshold of 50 dBA $L_{eq(1\text{-}hr)}$.

NOISE IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate project impacts under CEQA, provides a discussion of each project impact, and presents mitigation measures, where necessary, to reduce project impacts to less-than-significant levels.

Significance Criteria

The following criteria were used to evaluate the significance of environmental noise resulting from the project:

(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 groundborne vibration or groundborne 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, if the project would expose people residing or working in the project area to excessive noise levels.

Impact 1a: **Temporary Construction Noise.** Existing receptors are not expected to be exposed to temporary construction noise levels exceeding the City's threshold. In accordance with Policy HS-38 of the City's General Plan, this temporary noise impact would be reduced to a **less-than-significant** level with the incorporation of construction best management practices.

The project applicant proposes the construction of the three-story building with two floors of below-grade parking on the project site. The construction schedule assumed that the earliest possible start date would be early February 2023, and the development would be built over a period of 18 months. Construction hours are expected to be limited to weekdays between the hours 7:00 a.m. and 5:00 p.m. Construction phases would include site preparation, excavation, grading, trenching, building construction, architectural coating, and paving. During each phase of construction, there would be a different mix of equipment operating, and noise levels would vary by phase and vary within phases, based on the amount of equipment in operation and the location at which the equipment is operating.

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Based on General Plan Policy HS-38, developers are required to mitigate noise exposure to sensitive receptors resulting from construction activities. Mitigation may include reducing construction noise at the source, as the sound is being transmitted through the air, and at the receptor. Municipal Code Section 6.16.070 prohibits noise from non-emergency operation of construction equipment from exceeding 85 dBA at a distance of 100 feet between the hours of 7:00 a.m. and 10:00 p.m. and from exceeding 60 dBA at a distance of 100 feet from 10:00 p.m. until 7:00 a.m. unless a permit is obtained from the director of public works.

Construction activities for individual projects are typically carried out in phases. During each phase of construction, there would be a different mix of equipment operating, and noise levels would vary by phase and vary within phases, based on the amount of equipment in operation and the location at which the equipment is operating. The typical range of maximum instantaneous noise levels for the proposed project would be 70 to 90 dBA L_{max} at a distance of 50 feet (see Table 5) from the equipment. Table 6 shows the hourly average noise level ranges, by construction phase, typical for various types of projects. Hourly average noise levels generated by construction typically are about 75 to 89 dBA L_{eq} for commercial buildings, measured at a distance of 50 feet from the center of a busy construction site. Construction-generated noise levels drop off at a rate

of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain often results in lower construction noise levels at distant receptors.

Typical equipment expected to be used regularly during each construction phase are summarized in Table 7, along with the quantity of each type of equipment and the reference noise level at 100 feet, assuming the operation of the two loudest pieces of construction equipment for each construction phase.

Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to calculate the typical hourly average noise levels for each phase of construction, assuming the two loudest pieces of equipment would operate simultaneously, as recommended by the Federal Transit Administration (FTA) for construction noise evaluations. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Table 7 also summarizes the construction noise levels for the two loudest pieces of equipment propagated to the surrounding receiving land uses.

To assess construction noise impacts at the receiving property lines of existing noise-sensitive receptors, the worst-case hourly average noise level, which would result in the noise levels summarized in Table 7, was propagated from the geometrical center of the project site to the nearest property lines of the receptors. These noise level estimates are shown in Table 8. Noise levels in Table 8 do not assume reductions due to intervening buildings or existing barriers.

A planned mixed-use development at the location of the existing shopping mall to the east is currently under review at the City. While a construction schedule for this planned project is not available, the future occupants of this site would be noise-sensitive receptors and could potentially occupy the site during construction of the proposed project. Therefore, assuming worst-case conditions, construction noise levels were estimated at the nearest property lines for the future receptors at that site.

TABLE 5 Construction Equipment 50-Foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

[1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3] Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

TABLE 6 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I - All pertinent equipment present at site.
II - Minimum required equipment present at site.

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

TABLE 7 Estimated Construction Noise Levels for the Proposed Project Building at a Distance of 100 feet

Phase of Construction	Total Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 100 feet
Site Preparation	5 days	Excavator (1) Rubber-Tired Dozer (1)[a] Tractor/Loader/Backhoe (1)[a]	76 dBA L_{eq}
Grading/Excavation	45 days	Excavator (2) Grader (1)[a] Tractor/Loader/Backhoe (2)[a] Drill Rig (1)	78 dBA L_{eq}
Trenching/Foundation	120 days	Tractor/Loader/Backhoe (2)[a]	77 dBA L_{eq}
Building – Exterior	136 days	Crane (1) Forklift (1) Tractor/Loader/Backhoe (1)[a] Welder (1)	76 dBA L_{eq}
Building – Interior/ Architectural Coating	133 days	Air Compressor (2)[a] Aerial Lift (4)[a]	69 dBA L_{eq}
Paving	40 days	Cement and Mortar Mixer (1) Paver (2)[a] Paving Equipment (3)[a] Roller (2) Tractor/Loader/Backhoe (2)[a]	78 dBA L_{eq}

[a] Denotes two loudest pieces of construction equipment per phase.

TABLE 8 Estimated Construction Noise Levels at Nearby Land Uses

Phase of Construction	Calculated Hourly Average Noise Levels, L_{eq} (dBA)					
	West Res. (150ft)	**NW Res. (220ft)**	**North Comm. (125ft)**	**South Hotel, Medical & Comm. (825ft)**	**East Future Mixed-Use (385ft)**	**SE Res. & Comm. (680ft)**
Site Preparation	73 dBA L_{eq}	69 dBA L_{eq}	74 dBA L_{eq}	58 dBA L_{eq}	64 dBA L_{eq}	59 dBA L_{eq}
Grading/Excavation	74 dBA L_{eq}	71 dBA L_{eq}	76 dBA L_{eq}	59 dBA L_{eq}	64 dBA L_{eq}	61 dBA L_{eq}
Trenching/Foundation	74 dBA L_{eq}	70 dBA L_{eq}	72 dBA L_{eq}	56 dBA L_{eq}	65 dBA L_{eq}	57 dBA L_{eq}
Building –Exterior	72 dBA L_{eq}	69 dBA L_{eq}	74 dBA L_{eq}	58 dBA L_{eq}	64 dBA L_{eq}	59 dBA L_{eq}
Building – Interior/ Architectural Coating	65 dBA L_{eq}	62 dBA L_{eq}	67 dBA L_{eq}	50 dBA L_{eq}	57 dBA L_{eq}	52 dBA L_{eq}
Paving	75 dBA L_{eq}	72 dBA L_{eq}	77 dBA L_{eq}	60 dBA L_{eq}	67 dBA L_{eq}	62 dBA L_{eq}

Construction noise levels are anticipated to comply with the City of San Bruno's Municipal Code threshold of 85 dBA at 100 feet during daytime hours on typical construction days.

Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction material, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life. With the incorporation of construction best management practices as a project condition of approval, in compliance with Policy HS-38 of the City's General Plan, construction noise exposure at sensitive receptors would be reduced as much as possible. Therefore, this would be a less-than-significant impact.

Construction Best Management Practices

Implementation of the following construction best management practices would reduce the construction noise levels at sensitive receptors as much as possible:

- Limit construction hours to between 7:00 a.m. and 7:00 p.m., Monday through Friday.

- Construct temporary noise barriers, where feasible, around the perimeter of the construction site. Temporary noise barrier fences would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receiver and if the barrier is constructed in a manner that eliminates any cracks or gaps.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Unnecessary idling of internal combustion engines should be strictly prohibited.

- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as possible from sensitive receptors as feasible. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used reduce noise levels at the adjacent sensitive receptors. Any enclosure openings or venting shall face away from sensitive receptors.

- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

- Control noise from construction workers' radios to a point where they are not audible at existing commercial uses bordering the project site.

- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent land uses so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

Implementation of the above best management practices would reduce construction noise levels emanating from the site and minimize disruption and annoyance. With the incorporation of these measures and recognizing that noise generated by construction activities would occur over a temporary period, overall noise exposure would be minimized at sensitive receptors in the project vicinity. This would be a less-than-significant impact.

Mitigation Measure 1a: No further mitigation required.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. The proposed project would not result in a substantial permanent noise level increase at residential uses. **This is a less-than-significant impact.**

A significant impact would result if the proposed project would result in a substantial permanent increase in noise levels at sensitive receptors in the vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level of less than 60 dBA L_{dn}; or b) the noise level increase is 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater. Noise-sensitive receptors surrounding the project site are exposed to existing noise levels greater than 60 dBA L_{dn}; therefore, a significant noise increase would occur if project-generated operations would permanently increase noise levels by 3 dBA L_{dn}.

Section 6.16.050 of the City's Municipal Code prohibits the generation of noise exceeding ambient zone base levels by 10 dBA at the property plane of any property. Due to the noisy location of the project site and its surrounding receptors, existing ambient noise levels range from 68 to 72 dBA L_{eq} (average of 71 dBA L_{eq}) during daytime hours and from 62 to 71 dBA L_{eq} (average of 67 dBA L_{eq}) during nighttime hours. Therefore, daytime and nighttime thresholds of 81 and 77 dBA L_{eq}, respectively, would apply to the receptors in the project vicinity.

Project Traffic Increase

The traffic study included peak hour turning movements for existing traffic volumes and existing plus project traffic volumes at eight intersections in the vicinity of the project site. By comparing the existing plus project volumes to the existing volumes, the project's contribution to the overall noise increase is calculated. Table 9 summarizes the estimated noise level increase along each roadway segment included in the traffic report. As shown in Table 9, the project's contribution would be at or below 1 dBA L_{dn} along all segments in the project vicinity. The project would not result in a permanent noise increase of 3 dBA L_{dn} or more at noise-sensitive receptors in the project vicinity.

TABLE 9 Estimated Noise Level Increases of Existing Plus Project Traffic Volumes Over Existing Traffic Volumes at Receptors in the Project Vicinity

Roadway	Segment	Estimated Noise Level Increase Over Existing Volumes
Admiral Court	South of Commodore Drive	0 dBA L_{dn}
Commodore Drive	El Camino Real to Admiral Court	0 dBA L_{dn}
	Admiral Court to Cherry Avenue	0 dBA L_{dn}
	West of Cherry Avenue	0 dBA L_{dn}
El Camino Real	North of Sneath Lane	1 dBA L_{dn}
	Sneath Lane to Commodore Drive	0 dBA L_{dn}
	Commodore Drive to I-380 westbound ramps	1 dBA L_{dn}
	I-380 westbound ramps to I-380 eastbound ramps	1 dBA L_{dn}
	I-380 eastbound ramps to Bayhill Drive	1 dBA L_{dn}
	South of Bayhill Drive	1 dBA L_{dn}
I-380 westbound ramps at El Camino Real	Off-ramp	1 dBA L_{dn}
	On-ramp	0 dBA L_{dn}
I-380 eastbound ramps at El Camino Real	Off-ramp	1 dBA L_{dn}
	On-ramp	0 dBA L_{dn}
Sneath Lane	East of El Camino Real	0 dBA L_{dn}
	El Camino Real to National Avenue	0 dBA L_{dn}
	West of National Avenue	0 dBA L_{dn}
Bayhill Drive	West of El Camino Real	1 dBA L_{dn}
Cherry Avenue	North of Commodore Drive	1 dBA L_{dn}
	South of Commodore Drive	1 dBA L_{dn}
National Avenue	South of Sneath Lane	0 dBA L_{dn}

Automotive Dealership Operations

Equipment associated with car washing and detailing activities would occur in the basement level. The surrounding noise-sensitive receptors would be well shielded from noise generated underground. Therefore, the City's Municipal Code threshold would not be exceeded at the surrounding receptors, and the proposed noise-generating equipment located underground would not measurably contribute to ambient noise level increase in the area (0 dBA L_{dn} increase).

The ground level site plan includes the service shop, which would be fully enclosed by the building. The building façade would adequately shield the surrounding receptors from automobile mechanic activities and other operations within the service shop. Therefore, the City's Municipal Code threshold would not be exceeded at the surrounding receptors, and the proposed noise-generating equipment located within the proposed building would not measurably contribute to ambient noise level increase in the area (0 dBA L_{dn} increase).

No loudspeaker or amplified sound systems are proposed for this project. Automotive dealership operations would result in a less-than-significant impact.

Mechanical Equipment

Mechanical equipment rooms are shown on both basement levels and each of the above-ground floors. For all equipment located on the building interior, noise levels generated by this equipment would not be audible at the property lines. Two condensers are located on the ground level in the southeastern corner of the building, which would be shielded from receptors to the northwest and north. Two additional condensers are located along the western façade, which would be shielded from commercial receptors to the north and east, as well as the residential and commercial receptors southeast of the I-380/El Camino Real interchange. Each of these condensers would generate noise levels of 61 dBA at a distance of 1 meter (3.28 feet). Assuming each pair of condensers operate continuously during daytime and nighttime hours, the combined hourly average noise levels would be 64 dBA L_{eq} measured at a distance of 3.28 feet at each ground level location at the proposed building.

Solar panel canopies are located on the rooftop, with parking spaces below the solar panels. Solar panels do not generate noise levels audible at the property lines and would not impact surrounding land uses. Additionally, the roof plan shows condensing units and exhaust fans located in the center of the roof along the northern edge. These condensing units would generate noise levels up to 61 dBA at a distance of 1 meter (3.28 feet), and the exhaust fans would generate noise levels ranging from 55 to 61 dBA at a distance of 1 meter (3.28 feet). Assuming all six condensers and all three exhaust fans operate continuously during daytime and nighttime hours, which would represent worst-case conditions, the combined hourly average noise levels would be up to 69 dBA L_{eq} at a distance of 3.28 feet. The roof plan also shows an exhaust fan with noise levels of 60 dBA at 1 meter (3.28 feet), an outside air unit with noise levels of 81 dBA at 1 meter (3.28 feet), and five air conditioning units with noise levels ranging from 81 to 87 dBA at 1 meter (3.28 feet) located near the center of the rooftop. Assuming all equipment operates continuously during daytime and nighttime hours, the combined hourly average noise levels would be 92 dBA L_{eq} at a distance of 3.28 feet.

Noise levels generated by all mechanical noise sources were propagated to the property lines of each of the surrounding receptors. As mentioned above, some of the ground condensers would be adequately shielded from the receptors by the intervening dealership building. Further, ground level receptors would be partially shielded from the rooftop equipment; however, the farther the receptors are from the building, the less attenuation there would be. Therefore, no attenuation is assumed for rooftop equipment at receptors to the east, to the south, and to the southeast. The residential buildings to the west and to the northwest would have elevated receptors, which would have direct exposure to the rooftop equipment. Assuming worst-case conditions, no attenuation is assumed for these receptors either. The ground-level commercial uses to the north would be partially shielded from the rooftop equipment. Conservatively, 10 dBA attenuation is assumed for these ground-level receptors adjoining the project site.

Hourly average noise levels would not exceed the 81 dBA daytime threshold or the 77 dBA nighttime threshold at the property lines of the surrounding noise-sensitive land uses. The estimated noise level

increase at the western residential building would be 1 dBA L_{dn}. Mechanical equipment would not measurably contribute to ambient noise level increase at the remaining receptors surrounding the site (0 dBA L_{dn} increase). This would be a less-than-significant impact.

TABLE 10 Estimated Mechanical Equipment Noise Levels at Receiving Land Uses

Receptor	SE Corner Ground Equipment		Western Façade Ground Equipment		North Edge Rooftop Equipment		Center Rooftop Equipment		Combined L_{eq}, dBA	Combined L_{dn}, dBA	Noise Level Increase (L_{dn}), dBA
	Distance	Hourly L_{eq}, dBA	Distance	Hourly L_{eq}, dBA	Distance	Hourly L_{eq}, dBA	Distance	Hourly L_{eq}, dBA			
West Residential	225 feet	27	35 feet	43	135 feet	36	115 feet	61	61	68	1
Northwest Residential	N/A[a]		155 feet	31	165 feet	34	180 feet	57	57	64	0
North Commercial	N/A[a]		N/A[a]		85 feet	30[b]	145 feet	49[b]	49	56	0
South Hotel, Medical & Commercial	765 feet	< 20	750 feet	< 20	850 feet	20	790 feet	44	44	51	0
East Future Mixed-Use	390 feet	23	N/A[a]		380 feet	27	420 feet	50	50	56	N/A[c]
Southeast Residential & Commercial	565 feet	< 20	N/A[a]		725 feet	22	690 feet	45	46	52	0

[a] These receptors would be well shielded from the ground-level noise sources due to the intervening project building.
[b] Minimum attenuation of 10 dB is assumed due to elevation of noise sources and building façade.
[c] Future receptors are not exposed to existing ambient noise levels; therefore, these receptors would not be exposed to a noise level increase under future conditions.

Parking Lot Noise

Indoor parking would be located in both basement levels, as well as levels 2 and 3 of the above-ground floors. Only 17 surface parking spaces would be located on the exterior of the building, which are designated for customers. All 17 parking spaces would be located on the northern building façade. Additionally, the roof plan would include parking beneath solar panels used for inventory. Showroom and sales would occur seven days a week from 9:00 a.m. to 7:00 p.m. Office administration would be limited to weekdays between 7:30 a.m. and 6:00 p.m. The service center and auto parts center would operate Monday through Saturday from 7:30 a.m. and 6:00 p.m. Therefore, all on-site parking activity would be limited to daytime hours only.

Noise sources associated with the use of the parking lots would include vehicular circulation, loud engines, door slams, and human voices. The maximum noise level of a passing car at 15 mph typically ranges from 45 to 55 dBA L_{max} at a distance of 100 feet. The noise generated during an engine start is similar. Door slams cause slightly lower noise levels. The hourly average noise levels resulting from all of these noise-generating activities in a busy parking lot typically ranges from 40 to 50 dBA L_{eq} at a distance of 100 feet from the parking area. It should be noted that due to the size of the customer parking lot and the infrequent activity expected at the inventory lot on the rooftop, parking lot noise levels at the proposed dealership are expected to be lower than these source levels; however, these would represent worst-case conditions.

Table 11 summarizes the estimated parking lot noise at the surrounding receptors when the noise source is centered at the nearest parking area on the project site. While the proposed buildings would provide partial shielding for some of the surrounding receptors, no attenuation is assumed in Table 11 under worst-case conditions.

TABLE 11 Estimated Parking Lot Noise Levels at Receiving Land Uses

Receptor	Distance from Center of Nearest Parking Area	Hourly L_{eq}	L_{dn}	Noise Level Increase, L_{dn}
West Residence	165 feet	36 to 46 dBA	43 dBA	0 dBA
NW Residence	140 feet	37 to 47 dBA	44 dBA	0 dBA
North Commercial	30 feet	51 to 61 dBA	57 dBA	0 dBA
South Hotel, Medical & Commercial	810 feet	22 to 32 dBA	29 dBA	0 dBA
East Future Mixed-Use	330 feet	30 to 40 dBA	37 dBA	N/A[a]
SE Residence & Commercial	670 feet	24 to 34 dBA	31 dBA	0 dBA

[c] Future receptors are not exposed to existing ambient noise levels; therefore, these receptors would not be exposed to a noise level increase under future conditions.

Noise levels resulting from parking activities would be well below ambient noise levels, and the proposed parking lot/parking activities would not measurably contribute to ambient noise levels in the area (0 dBA L_{dn} increase).

Truck Deliveries

Delivery vehicles for auto parts, servicing, and administrative supplies would utilize the south Commodore Drive driveway entry, and unloading would occur within the building. This would not impact the surrounding receptors. Additionally, an alternative extended parking area has been identified at the end of the Commodore Drive South driveway, which would be located along the southeastern corner of the building. This alternative parking area would likely be utilized by trucks and would be well shielded from the nearest surrounding receptors to the west, northwest, and north. Due to El Camino Real and I-380, the other nearby receptors would not be exposed to any audible noise levels from the extended truck parking.

Truck delivery noise would include maneuvering activities from both medium trash trucks accessing the trash enclosure and heavy trucks with trailers delivering automobiles. Trucks maneuvering would generate a combination of engine, exhaust, and tire noise, as well as the intermittent sounds of back-up alarms and releases of compressed air associated with truck/trailer air brakes.

A trash enclosure is located along the southern building façade and would be accessible from the southern Commodore Drive driveway. Trash trucks typically generate maximum noise levels ranging from 60 to 65 dBA L_{max} at 50 feet. Assuming one trash pickup in a 24-hour period, the hourly average noise level would be 59 dBA L_{eq}, and the day-night average noise level would be 45 dBA L_{dn}. The receptors to the north and northwest would be well shielded from trash pickup noise. The nearest receptor to the west would be approximately 70 feet from the trash enclosure. At this distance, hourly average noise levels would be 56 dBA L_{eq}, and day-night average noise levels would be 42 dBA L_{dn}. These levels would be below the daytime threshold of 81 dBA L_{eq}. All other receptors with direct line-of-sight to the trash enclosure would be over 600 feet away and would be exposed to hourly average noise levels below 40 dBA L_{eq}, and day-night average noise levels below 30 dBA L_{dn}. Trash pickup activities would not measurably contribute to ambient noise level increase in the area (0 dBA L_{dn} increase).

Automobile inventory would be delivered by use of vehicle truck trailers, which would unload vehicles along an open median strip of land in the Commodore right-of-way, approximately two blocks west of the dealership. Off-loading vehicles would be permitted Monday through Saturday between 7:00 a.m. and 7:00 p.m. Heavy trucks used for inventory deliveries would typically generate maximum instantaneous noise levels of 70 to 75 dBA L_{max} at a distance of 50 feet. The noise level of backup alarms can vary depending on the type and directivity of the sound, but maximum noise levels are typically in the range of 65 to 75 dBA L_{max} at a distance of 50 feet. Hourly average noise levels due to truck maneuvering from these trucks would be up to 70 dBA L_{eq} at 50 feet. Assuming two deliveries in a 24-hour period, the day-night average noise level would be 59 dBA L_{dn}.

Due to the location of the inventory delivery, the receptors would vary from other on-site operations. Table 12 summarizes the estimated truck maneuvering noise at the receptors in the vicinity of the delivery area for the automobile inventory.

TABLE 12 Estimated Truck Maneuvering Noise Levels at Receiving Land Uses

Receptor	Distance from Center of Inventory Truck Delivery Area	Hourly L_{eq}	L_{dn}	Noise Level Increase, L_{dn}
Acappella Apartments	145 feet	61 dBA	50 dBA	0 dBA
Federal Building	35 feet	73 dBA	62 dBA	0 dBA
El Portal School	465 feet	51 dBA	40 dBA	0 dBA
South Hotel, Medical, & Commercial	780 feet	46 dBA	35 dBA	0 dBA

Noise levels resulting from truck maneuvering activities would be below daytime ambient noise levels and daytime thresholds established in the Municipal Code. The proposed truck maneuvering activities would not measurably contribute to ambient noise level increase in the area (0 dBA L_{dn} increase).

Total Combined Project-Generated Noise

The operational noise levels produced by the proposed project combined (i.e., traffic, dealership operations, mechanical equipment, parking lot, truck loading/unloading activities, and truck pass-bys) would potentially result in a permanent noise increase of 1 dBA L_{dn} at the existing noise-sensitive receptors in the project vicinity. Further, operational noise levels are not expected to exceed levels 10 dBA above ambient noise levels during daytime and nighttime hours at the surrounding land uses. This is a less-than-significant impact.

Mitigation Measure 1b: None required.

Impact 2: Exposure to Excessive Groundborne Vibration. Construction-related vibration levels could exceed applicable vibration thresholds at nearby sensitive land uses. **This is a potentially significant impact.**

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include demolition, site preparation work, foundation work, and new building framing and finishing. Pile driving equipment, which can cause excessive vibration, is not expected to occur during construction of the proposed project.

The City of San Bruno does not specify a construction vibration limit. For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for new residential and modern commercial/industrial structures, 0.3 in/sec PPV for older residential structures, and a limit of 0.25 in/sec PPV for historic and some old buildings (see Table 3). The 0.3 in/sec PPV vibration limit would be applicable to properties in the immediate vicinity of the project site and the 0.25 in/sec PPV vibration limit would be applicable to the nearest historic property.

Figure 2, which is included in the City's General Plan, shows the historical resources in the City of San Bruno. From this figure, the nearest historical building is more than 800 feet southeast of the project's nearest boundary.

Table 13 presents typical construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity.

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 13 summarizes the vibration levels at each of the surrounding buildings in the project vicinity. Vibration levels are highest close to the source and then attenuate with increasing distance at the rate $\left({}^{D_{ref}}/_{D}\right)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet. While construction noise levels increase based on the cumulative equipment in use simultaneously, construction vibration levels would be dependent on the location of individual pieces of equipment. That is, equipment scattered throughout the site would not generate a collective vibration level, but a vibratory roller, for instance, operating near the project site boundary would generate the worst-case vibration levels for the receptor sharing that property line. Further, construction vibration impacts are assessed based on damage to buildings on receiving land uses, not receptors at the nearest property lines. Therefore, the distances used to propagate construction vibration levels (as shown in Table 13), which are different than the distances used to propagate construction noise levels (as shown in Table 8), were estimated under the assumption that each piece of equipment from Table 13 was operating along the nearest boundary of the project site, which would represent the worst-case scenario.

As shown in Table 13, the nearest historical building would not be exposed to construction vibration levels exceeding the 0.25 in/sec PPV threshold. The commercial building to the north would be exposed to vibration levels exceeding 0.3 in/sec PPV when vibratory rollers are used near the shared property line or heavy objects are dropped near the shared property line. All other buildings in the project vicinity would be exposed to vibration levels below the 0.3 in/sec PPV threshold.

FIGURE 2 Historic Resource Map with Project Site Identified

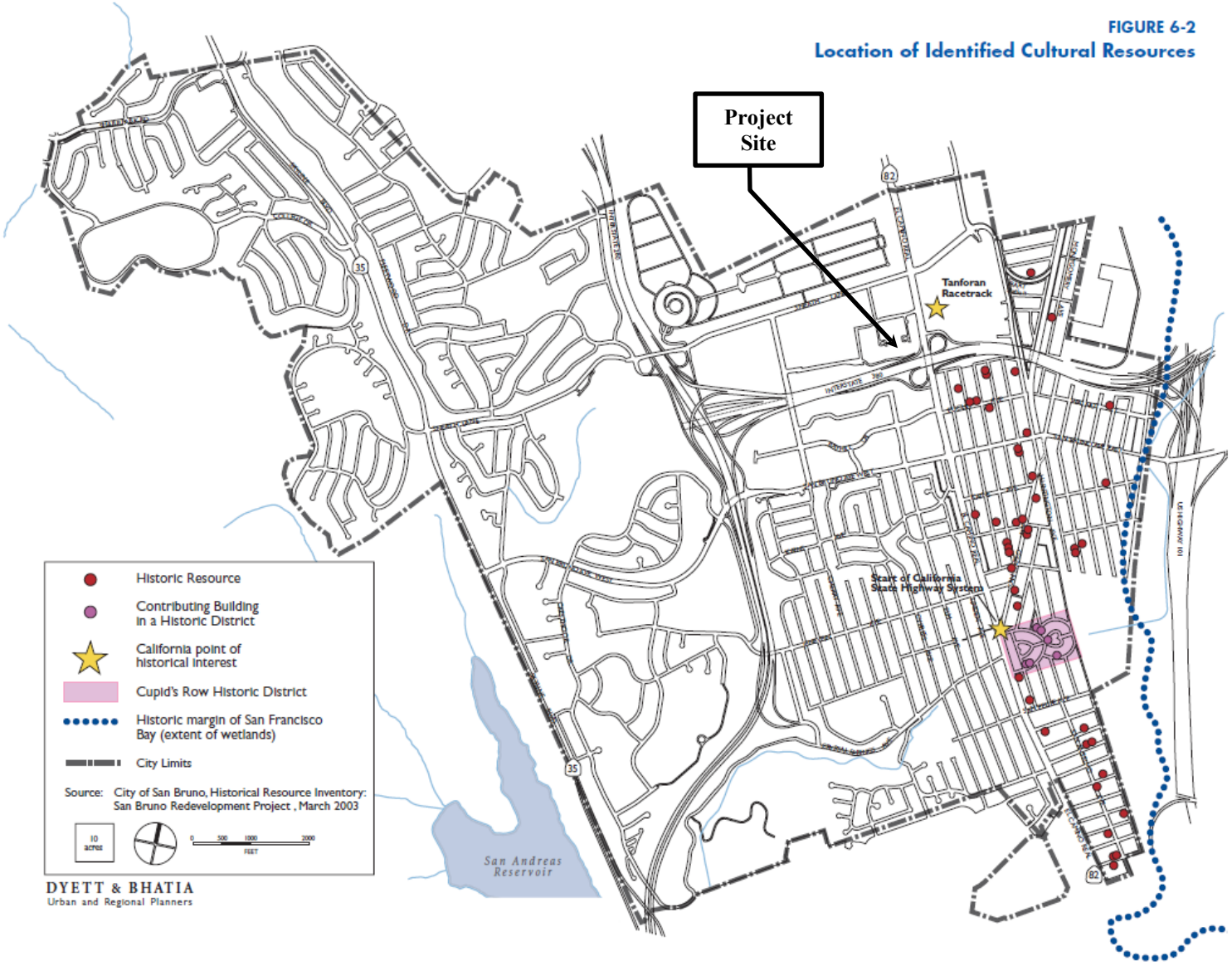


TABLE 13 Vibration Levels for Construction Equipment at a Source Distance of 25 feet and at the Nearest Surrounding Buildings.

Equipment		PPV at 25 ft. (in/sec)	Estimated Vibration Levels at Nearest Building Façades Surrounding the Project Site, in/sec PPV						
			Nearest Historical Building (800ft)	West Residential (40ft)	Northwest Residential (65ft)	North Commercial (15ft)	South Hotel, Medical & Commercial (675ft)	East Future Mixed-Use (175ft[a])	Southeast Residential & Commercial (585ft)
Clam shovel drop		0.202	0.004	0.120	0.071	**0.354**	0.005	0.024	0.006
Hydromill (slurry wall)	in soil	0.008	0.0002	0.005	0.003	0.014	0.0002	0.001	0.0002
	in rock	0.017	0.0004	0.010	0.006	0.030	0.0005	0.002	0.001
Vibratory Roller		0.210	0.005	0.125	0.073	**0.368**	0.006	0.025	0.007
Hoe Ram		0.089	0.002	0.053	0.031	0.156	0.002	0.010	0.003
Large bulldozer		0.089	0.002	0.053	0.031	0.156	0.002	0.010	0.003
Caisson drilling		0.089	0.002	0.053	0.031	0.156	0.002	0.010	0.003
Loaded trucks		0.076	0.002	0.045	0.027	0.133	0.002	0.009	0.002
Jackhammer		0.035	0.001	0.021	0.012	0.061	0.001	0.004	0.001
Small bulldozer		0.003	0.0001	0.002	0.001	0.005	0.0001	0.0004	0.0001

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., November 2022.

[a] This distance is from the proposed project site boundary to the property line of the future mixed-use development since the specific location of structures on the future mixed-use site is unknown, which represents worst-case conditions.

A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[3] The findings of this study have been applied to buildings effected by construction-generated vibrations.[4] As reported in USBM RI 8507[5] and reproduced by Dowding,[6] Figure 3 presents the damage probability, in terms of "threshold damage," "minor damage," and "major damage," at varying vibration levels. Threshold damage, which is described as cosmetic damage in this report, would entail hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage would include hairline cracking in masonry or the loosening of plaster, and major structural damage would include wide cracking or shifting of foundation or bearing walls.

As shown in Figure 3, maximum vibration levels of 0.4 in/sec PPV would result in less than 5% probability of threshold damage or cosmetic damage. No minor or major damage would occur with maximum vibration levels of 0.4 in/sec PPV.

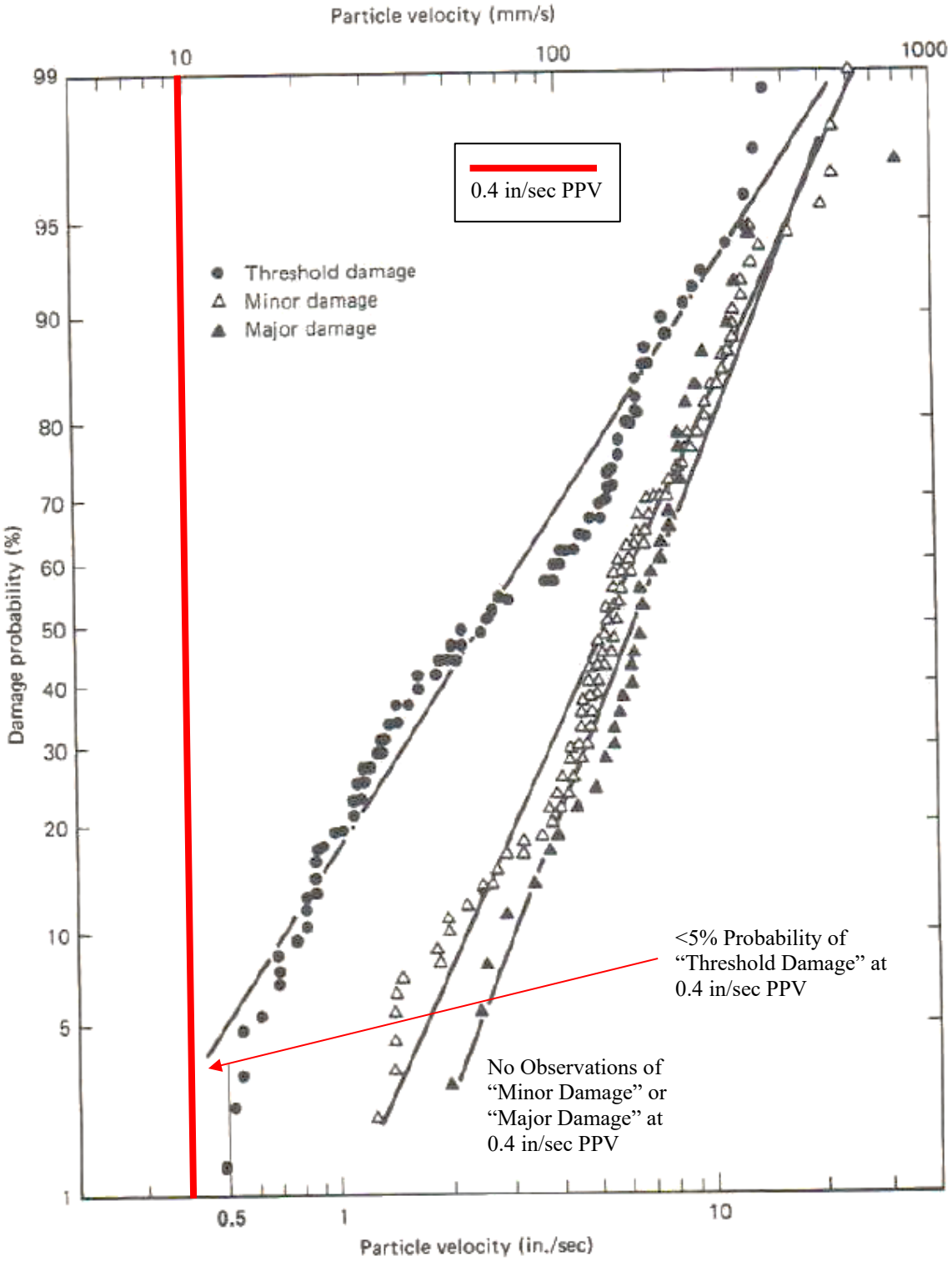
Neither cosmetic, minor, or major damage would occur at conventional buildings surrounding the project site to the west and northwest, as well as buildings farther than 200 feet from the site during use of typical construction activities. At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration during hours with the least potential to affect nearby businesses, perceptible vibration can be kept to a minimum.

In summary, the construction of the project would generate vibration levels exceeding the 0.3 in/sec PPV at the nearest buildings surrounding the site when vibratory rollers and clam shovel drops are used within 20 feet of the commercial structure to the north. This would be a potentially significant impact.

3 Siskind, D.E., M.S. Stagg, J.W. Kopp, and C.H. Dowding, Structure Response and Damage Produced by Ground Vibration form Surface Mine Blasting, RI 8507, Bureau of Mines Report of Investigations, U.S. Department of the Interior Bureau of Mines, Washington, D.C., 1980.

4 Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

FIGURE 3 Probability of Cracking and Fatigue from Repetitive Loading



Source: Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996, as modified by Illingworth & Rodkin, Inc., February 2023.

Mitigation Measure 2:

The following measures shall be implemented where vibration levels due to construction activities would exceed 0.3 in/sec PPV:

- Prohibit the use of vibratory rollers and the dropping heavy equipment within 20 feet of the commercial building to the north.

- Smaller equipment shall be used to reduce vibration levels to 0.3 in/sec PPV or less. For example, a smaller vibratory roller, such as the Caterpillar model CP433E vibratory compactor, could be used when compacting materials within 20 feet of the commercial building to the north .

- Avoid dropping heavy equipment and use alternative methods for breaking up existing pavement, such as a pavement grinder, instead of dropping heavy objects, within 20 feet of the commercial building to the north .

The implementation of these mitigation measures would reduce a potential impact to a less-than-significant level.

Impact 3: **Excessive Aircraft Noise.** The project site is located approximately 1.3 miles from the San Francisco International Airport. The noise environment attributable to aircraft is considered normally acceptable under the San Mateo County ALUC noise compatibility policies. This is a **less-than-significant** impact.

San Francisco International Airport is a public-use airport located approximately 1.3 miles southeast of the project site. According to the San Mateo County Airport Land Use Commission (ALUC) and the contours provided above in the Regulatory Criteria section, the project site lies outside the 70 dBA CNEL/L_{dn} contour line. The proposed project would be compatible with the City's exterior noise standards for aircraft noise. This would be a less-than-significant impact.

Mitigation Measure 3: **None required.**

Cumulative Impacts

Cumulative noise impacts would include temporary construction noise from cumulative construction projects. From the City's website,[5] there is only one planned or approved project within 1,000 feet of the project site (Tanforan located at 1122, 1150, and 1178 El Camino Real), which is located on the 44-acre site of the existing shopping mall. With El Camino Real located between the project sites and I-380 located to the south of both sites, all noise-sensitive receptors with direct exposure to construction noise at the proposed project site would have minimal exposure to construction noise from Tanforan, especially when activities occur more than 200 feet from the western shoulder of El Camino Real. Therefore, with the implementation of mitigation measures recommended for both projects, this would be a less-than-significant cumulative construction impact.

For a substantial permanent cumulative noise increase to occur, two qualifications must be met: 1) if the cumulative plus project traffic volumes result in a noise level increase at sensitive receptors of 5 dBA L_{dn} or greater, with a future noise level of less than 60 dBA L_{dn}, or of 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater, compared to existing traffic volumes; and 2) if the cumulative plus project traffic volumes result in a 1 dBA L_{dn} or more noise level increase compared to cumulative (no project) conditions, which would be considered a cumulatively considerable contribution to the overall traffic noise increase. While the traffic report did not include cumulative (no project) and cumulative plus project traffic volumes, background (no project) and background plus project volumes were included. These traffic conditions consist of projections for up to five years in the future and include other planned projects in the project vicinity. These future projections are used in place of cumulative conditions for the purpose of estimating cumulative traffic noise impacts.

The traffic study included peak hour turning movements for background and background plus project at eight intersections in the vicinity of the project site. Table 14 summarizes the noise level difference calculated by comparing both the background (no project) and background plus project traffic scenarios to the existing scenario. As shown in Table 14, a noise level increase of 3 dBA L_{dn} or more was not calculated along any roadway segment in the project vicinity, which does not satisfy the first qualification for a permanent cumulative noise increase. Therefore, the project would not result in substantial cumulative traffic noise increase.

[5] https://sanbruno.ca.gov/248/Development-Activity

TABLE 14 Estimated Noise Level Increases of Background and Background Plus Project Traffic Volumes Over Existing Volumes at Receptors in the Project Vicinity

Roadway	Segment	Estimated Noise Level Increase Over Existing Volumes		Project's Contribution
		Background	Background Plus Project	
Admiral Court	South of Commodore Drive	1 dBA L_{dn}	1 dBA L_{dn}	0 dBA L_{dn}
Commodore Drive	El Camino Real to Admiral Court	1 dBA L_{dn}	1 dBA L_{dn}	0 dBA L_{dn}
	Admiral Court to Cherry Avenue	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
	West of Cherry Avenue	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
El Camino Real	North of Sneath Lane	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
	Sneath Lane to Commodore Drive	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	Commodore Drive to I-380 westbound ramps	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	I-380 westbound ramps to I-380 eastbound ramps	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	I-380 eastbound ramps to Bayhill Drive	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	South of Bayhill Drive	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
I-380 westbound ramps at El Camino Real	Off-ramp	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	On-ramp	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
I-380 eastbound ramps at El Camino Real	Off-ramp	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	On-ramp	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
Sneath Lane	East of El Camino Real	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
	El Camino Real to National Avenue	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
	West of National Avenue	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}
Bayhill Drive	West of El Camino Real	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
Cherry Avenue	North of Commodore Drive	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
	South of Commodore Drive	0 dBA L_{dn}	1 dBA L_{dn}	1 dBA L_{dn}
National Avenue	South of Sneath Lane	0 dBA L_{dn}	0 dBA L_{dn}	0 dBA L_{dn}

APPENDIX A

FIGURE A1 Daily Trend in Noise Levels for LT-1, Wednesday, August 17, 2022

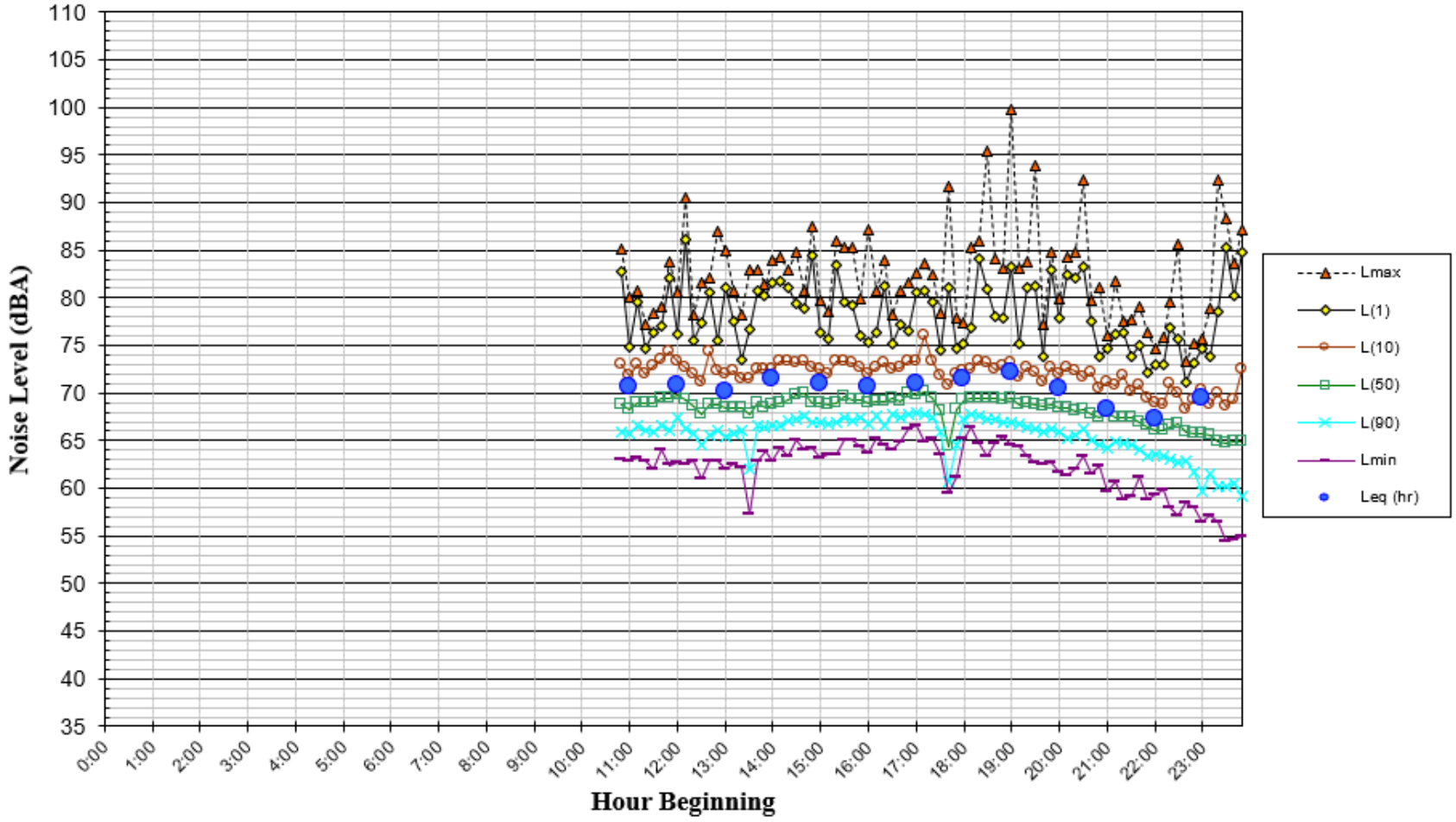


FIGURE A2 Daily Trend in Noise Levels for LT-1, Thursday, August 18, 2022

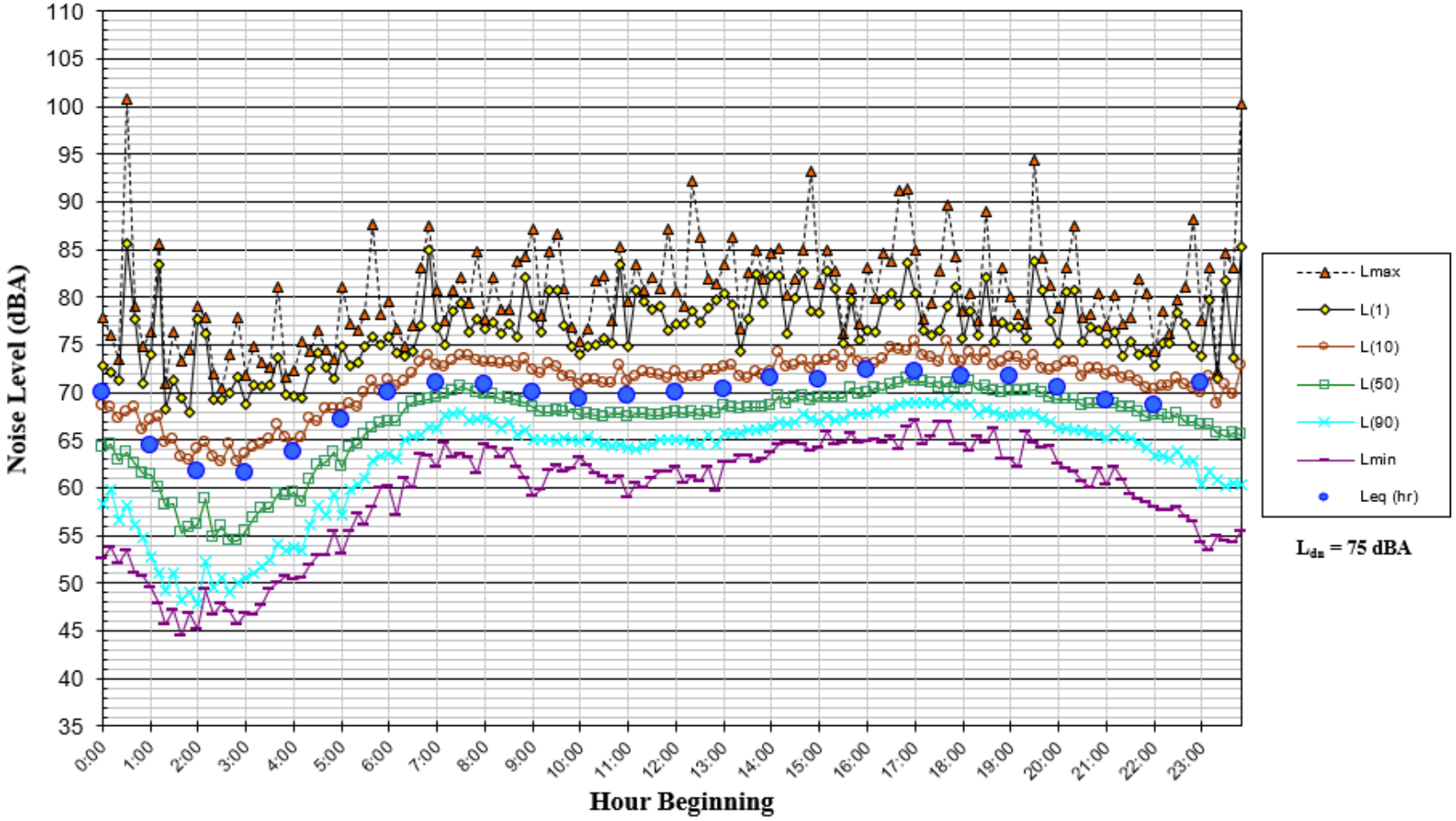


FIGURE A3 Daily Trend in Noise Levels for LT-1, Friday, August 19, 2022