1520 WEST SAN CARLOS MIXED-USE PROJECT NOISE AND VIBRATION ASSESSMENT

San José, California

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Prepared for:

Patrick Kallas
Assistant Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

Heather Bruce
Carrie J. Janello

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

I&R Job No.: 21-110

INTRODUCTION

The 1520 West San Carlos Mixed-Use project proposes the construction of a seven-story mixed-use building with frontage along West San Carlos Street in San José, California. The project would include approximately 15,582 square feet of commercial space on the ground floor and second floor of the building along West San Carlos Street. The project would also include affordable housing consisting of 25 residential units in an attached five-story portion of the larger building. The affordable housing would be connected to the parking garage and would be accessible from a separate entrance along Willard Avenue. Parking for all residential units and commercial space would be located in a garage with one level below ground and one level on the first floor. The garage would be accessible from Willard Avenue.

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 DNL. Typically, the highest steady traffic noise level during the daytime is about equal to the DNL 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 DNL with open windows and 65 to 70 dBA DNL 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 DNL 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 DNL. At a DNL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the DNL 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 DNL of 60 to 70 dBA. Between a DNL 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 DNL 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, Santa Clara County, and the City of San José. The State CEQA Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

Federal Government

Federal Transit Administration. The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[1] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses and to 90 dBA L_{eq} at commercial and industrial land uses.

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:

1 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

(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 Code, Title 24, Part 2. The current version of the California Building Code (CBC) requires interior noise levels in multi-family residential units attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA DNL/CNEL in any habitable room.

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.

Santa Clara County

***Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan*.** The Comprehensive Land Use Plan (CLUP) adopted by the Santa Clara County Airport Land Use Commission contains standards for projects within the vicinity of San José International Airport which are relevant to this project;

4.3.2.1 Noise Compatibility Policies

N-1 The Community Noise Equivalent Level (CNEL) method of representing noise levels shall be used to determine if a specific land use is consistent with the CLUP.

N-2 In addition to the other policies herein, the Noise Compatibility Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (not shown in this report).

N-6 Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport.

Table 4 - 1

NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally 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. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** 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. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should 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. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

Source: Based on General Plan Guidelines, Appendix C (2003), Figure 2 and Santa Clara County ALUC 1992 Land Use Plan, Table 1

Source: Comprehensive Land Use Plan Santa Clara County, Norman Y Mineta San José International Airport, May 25, 2011, Amended May 23, 2019.

City of San José

City of San José General Plan. The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies in the City of San José. The following policies are applicable to the proposed project:

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 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 (Table EC-1). 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.

Table EC-1: Land Use Compatibility Guidelines for Community Noise in San José

LAND USE CATEGORY	EXTERIOR NOISE EXPOSURE (DNL IN DECIBELS (DBA)) 55	60	65	70	75	80
1. Residential, Hotels and Motels, Hospitals and Residential Care[1]						
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
3. Schools, Libraries, Museums, Meeting Halls, Churches						
4. Office Buildings, Business Commercial, and Professional Offices						
5. Sports Arena, Outdoor Spectator Sports						
6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters						

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

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:

- Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.

Unacceptable:

- New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: Envision San José 2040 General Plan, Adopted November 1, 2011, As Amended on May 16, 2019.

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.

EC-1.3 Mitigate noise generation of new nonresidential land uses to 55 dBA DNL at the property line when located adjacent to existing or planned noise sensitive residential and public/quasi-public land uses.

EC-1.6 Regulate the effects of operational noise from existing and new industrial and commercial development on adjacent uses through noise standards in the City's Municipal Code.

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.

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.

Regulatory Background – Vibration

City of San José

City of San José General Plan. The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies to achieve the goal of minimizing vibration impacts on people, residences, and business operations in the City of San José. The following policies are applicable to the proposed project:

EC-2.3 Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or building that are documented to be structurally weakened, a continuous 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 continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction. Equipment or activities typical of generating continuous vibration include but are not limited to: excavation equipment; static compaction equipment; vibratory pile drivers; pile-extraction equipment; and vibratory compaction equipment. Avoid use of impact pile drivers within 125 feet of any buildings, and within 300 feet of historical buildings, or buildings in poor condition. On a project-specific basis, this distance

of 300 feet may be reduced where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction. Transient vibration impacts may exceed a vibration limit of 0.08 in/sec PPV only when and where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction.

Existing Noise Environment

The project site is located at 1520 West San Carlos Street in San José, California. The site is currently developed, and the project will include the demolition of all existing buildings on site. Adjoining the site to the east and to the west are commercial and residential uses, with additional residential uses to the south. Opposite West San Carlos Street to the north are residential uses. Opposite Willard Avenue to the east are residential uses.

The existing noise environment at the site results primarily from local vehicular traffic along West San Carlos Street. Distant traffic noise from SR 87, I-280, and I-880 and aircraft noise associated with Mineta San José International Airport also contribute to the noise environment.

A noise monitoring survey consisting of two long-term (LT-1 and LT-2) and two short-term (ST-1 and ST-2) noise measurements was made at the site between Wednesday, October 27, 2021, and Friday, October 29, 2021. Noise measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was made in front of the restaurant adjoining the site to the west, approximately 40 feet south of the centerline of West San Carlos Street. This measurement quantifies the traffic noise along West San Carlos Street during typical daytime and nighttime activities. Hourly average noise levels at LT-1 typically ranged from 66 to 77 dBA L_{eq} during daytime hours (7:00 a.m. and 10:00 p.m.) and from 49 to 60 dBA L_{eq} during nighttime hours (10:00 p.m. and 7:00 a.m.). The day-night average noise level on Thursday, October 28, 2021 was 72 dBA DNL. The daily trend in noise levels at LT-1 is shown in Figures A1 through A3 of Appendix A.

LT-2 was made along the western boundary of the project site, set back approximately 145 feet from the centerline of West San Carlos Street. This measurement represents the existing ambient noise environment for the residential receptors set back from the roadway. Hourly average noise levels at LT-2 typically ranged from 49 to 60 dBA L_{eq} during daytime hours and from 46 to 59 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday, October 28, 2021 was 59 dBA DNL. The daily trend in noise levels at LT-2 is shown in Figures A4 through A6 of Appendix A.

Short-term noise measurements ST-1 and ST-2 were made on Wednesday, October 27, 2021, between 11:50 a.m. and 12:20 p.m. in 10-minute intervals. Results of the measurements are summarized in Table 4.

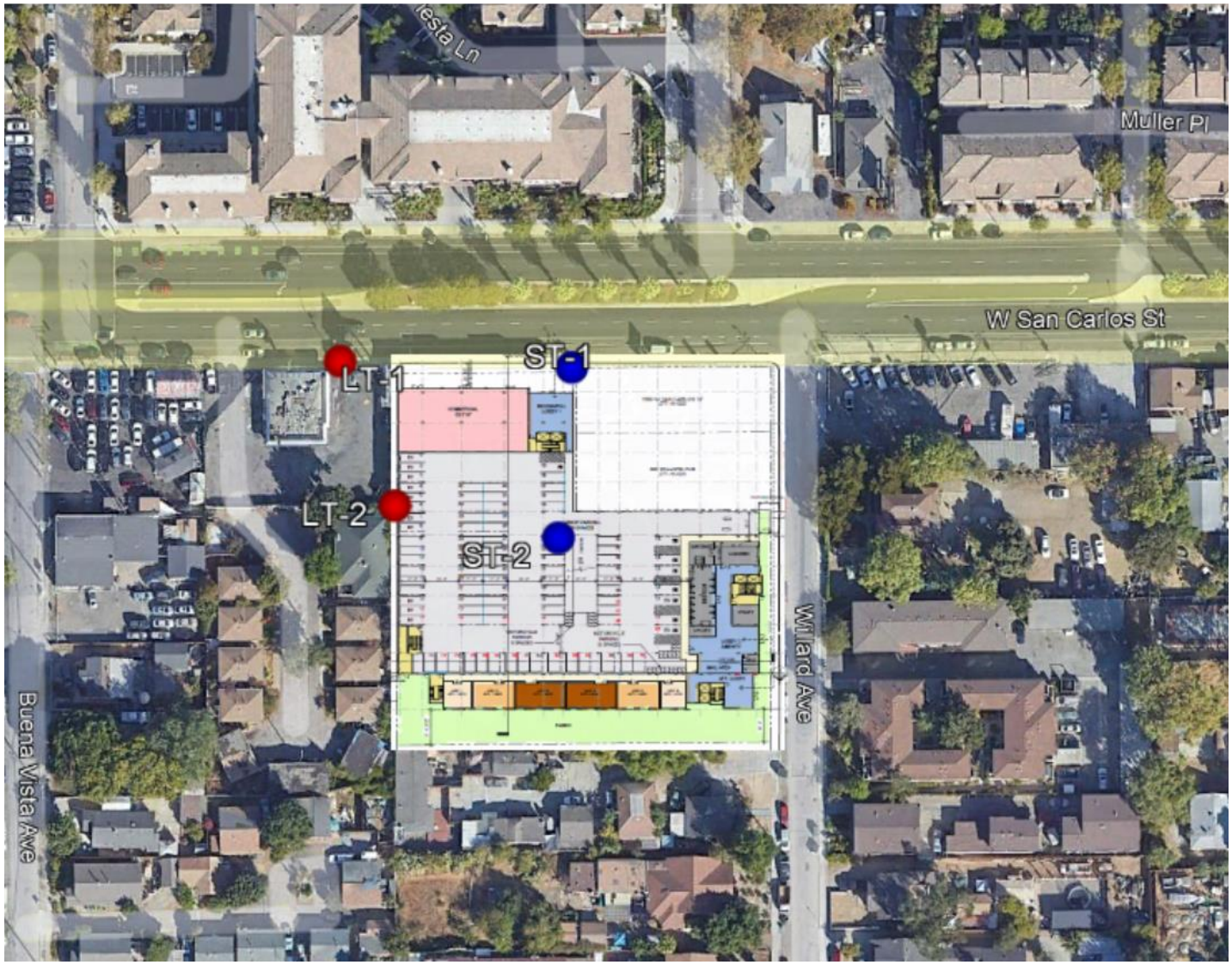
ST-1 was made at the center of the project site at about the same setback as LT-1 (40 feet from the centerline of West San Carlos Street). The major noise source measured at ST-1 included traffic noise along West San Carlos Street, which consisted of heavy trucks with noise levels of 71 to 80 dBA, passenger cars with noise levels of 54 to 80 dBA, a bus with noise level of 75 dBA, and a motorcycle with a noise level of 73 dBA. Additionally, a pressure washer from the far side of the car lot generated noise levels at ST-1 ranging from 52 to 56 dBA; a distant leaf blower generated noise levels of 49 to 51 dBA; and jets generated noise levels of 61 dBA. The 10-minute L_{eq} measured at ST-1 was 66 dBA.

ST-2 was made at the center of the project site, set back approximately 165 feet from the centerline of West San Carlos Street. The major noise contributors at ST-2 included traffic noise along the roadway, which consisted of heavy trucks with noise levels of 59 dBA and passenger cars with noise levels of 46 to 64 dBA. A pressure washer on the nearby car lot generated noise levels of 46 to 48 dBA. The 10-minute L_{eq} measured at ST-2 was 51 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: ~40 feet from the centerline of West San Carlos Street	10/27/2021, 11:50-12:00	80	76	70	61	50	66
ST-2: center of the project site	10/27/2021, 12:10-12:20	64	60	53	49	45	51

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 Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques and through appropriate land use policies in the City of San José. The applicable General Plan policies were presented in detail in the Regulatory Background section and are summarized below for the proposed project:

- The City's acceptable exterior noise level standard is 60 dBA DNL or less for the proposed residential land uses.

- The City's acceptable interior noise level standard is 45 dBA DNL or less for the proposed residential land uses.

- 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 West San Carlos Street and aircraft associated with the Norman Y. Mineta San José International Airport.

The traffic study completed for the proposed project included peak hour trips but did not include future cumulative traffic volumes. According to the traffic study completed for the *Envision San Jose 2040 General Plan Comprehensive Update Draft Environmental Impact Report*,[2] the traffic noise level increase at the project site would be 1 dBA DNL above existing conditions under the worst-case 2035 buildout conditions. Based on the future traffic volumes along West San Carlos Street, the project would not measurably contribute to the future traffic noise increase. Therefore, the total increase expected at the project site by the year 2035 would be 1 dBA DNL over existing measurements discussed above in the Setting Section.

Future Exterior Noise Environment

The site plan shows a paseo at the rear of the building on the ground level, a courtyard on the fourth level, a rooftop patio on the sixth level of the affordable housing building, and a roof deck on the eighth level. Each of these outdoor use areas would be associated with the residential component of the proposed project and subject to the City's 60 dBA DNL exterior noise threshold. A second-floor garden is also shown on the site plan; however, the site plan states that the garden would not be accessible to residents. So, this is not treated as an outdoor use area intended for extended use.

[2] Illingworth & Rodkin, Inc., *Envision San José 2040 General Plan Comprehensive Update Environmental Noise Assessment*, December 2010.

The ground-level paseo located to the rear of the proposed building would be completely shielded from West San Carlos Street. The center of the paseo would be set back approximately 150 feet from the centerline of Willard Avenue. At this distance, future exterior noise levels would be below 60 dBA DNL.

The fourth-floor courtyard wraps around the interior of the building. The center of the courtyard would be set back from the center of West San Carlos Street by approximately 200 feet. The western façade of the building would provide partial shielding for the courtyard. In combination with the elevation of the courtyard and the setback from the roadway, future exterior noise levels due vehicular traffic noise would be below 60 dBA DNL.

The rooftop patio associated with the affordable housing units would be located on the sixth floor at the rear of the building. The building would adequately shield this roof deck. Future exterior noise levels would be below 60 dBA DNL.

The roof deck located on the eighth floor would be located along the eastern façade and would be shielded by the building to the north, to the west, and to the south of the roof deck. The center of the roof deck is set back approximately 155 feet from the centerline of West San Carlos Street. The building and the elevation of the roof deck would provide partial shielding for the outdoor use area. Future exterior noise levels would be below 60 dBA DNL.

The future noise levels at the centers of the outdoor use areas associated with the residential component of the proposed project would meet the City's normally acceptable threshold of 60 dBA DNL. Therefore, the proposed project would be compatible with the future noise environment at the project site.

Future Interior Noise Environment

Residential Uses

Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Where exterior noise levels range from 60 to 65 dBA DNL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA DNL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion.

Residential units are located on floors two through eight of the proposed building. Units located along the northern façade nearest West San Carlos Street would be set back from the centerline of the roadway by approximately 65 feet. At this distance, the units facing West San Carlos Street would be exposed to future exterior noise levels up to 71 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be up to 56 dBA DNL.

Residential units located along the eastern and western façades would be set back from the centerline of San Carlos Street by approximately 65 to 285 feet. At these distances, the residential units along the eastern and western façades would be exposed to future exterior noise levels ranging from 60 to 71 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would range from 45 to 56 dBA DNL.

Units along the southern façade would be well shielded from traffic noise along West San Carlos Street. These units would be exposed to future exterior noise levels at or below 60 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would at or below 45 dBA DNL.

To meet the interior noise requirements set forth by the City of San José of 45 dBA DNL, implementation of noise insulation features would be required.

Commercial Land Uses

Ground-level commercial retail is proposed as part of the project on the first and second floors along the northern building façade. The setback from the centerline of West San Carlos Street would be approximately 65 feet. Daytime hourly average noise levels along the northern façade of the first two floors would range from 65 to 76 dBA L_{eq} at the exterior building façade, with day-night average noise level of 71 dBA DNL.

Standard construction materials for commercial 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 Insulation Features to Reduce Future Interior Noise Levels

The following noise insulation features shall be incorporated into the proposed project to reduce interior noise levels to 45 dBA DNL or less at residential interiors:

- Provide a suitable form of forced-air mechanical ventilation, as determined by the local building official, for all residential units on the project site, so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards.

- Preliminary calculations indicate that residential units along the northern building façade, as well as along the eastern and western façades within 130 feet of the centerline of West San Carlos Street, would require windows and doors with a minimum rating of 35 STC with adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

- For residential units along the eastern and western building façades located between 130 and 200 feet of the centerline of West San Carlos Street, windows and doors with a

minimum rating of 31 STC with adequate forced-air mechanical ventilation would be required to meet the interior noise threshold of 45 dBA DNL.

- All other units would meet the 45 dBA DNL threshold with standard construction materials with the incorporation of adequate forced-air mechanical ventilation.

The implementation of these noise insulation features would reduce interior noise levels to 45 dBA DNL or less at residential uses.

Conditions of Approval

Interior Noise Standard for Residential Mixed-Use Development. The project applicant shall prepare final design plans that incorporate building design and acoustical treatments to ensure compliance with State Building Codes and City noise standards. A project-specific acoustical analysis shall be prepared to ensure that the design incorporates controls to reduce interior noise levels to 45 dBA DNL or lower within the residential unit and to 50 dBA $L_{eq(1\text{-}hr)}$ or lower within nonresidential interiors. The project applicant shall conform with any special building construction techniques requested by the City's Building Department, which may include sound-rated windows and doors, sound-rated wall constructions, and acoustical caulking.

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 noise-sensitive land uses would be exposed to a temporary increase in ambient noise levels due to project construction activities. Since project construction would last for a period of more than one year and is located within 500 feet of existing residences and 200 feet within 200 feet of commercial uses, this would be a **significant** impact.

The project applicant proposes to demolish the existing buildings on the project site. The construction schedule assumed that the earliest possible start date would be the beginning of June 2023, and the project would be built out over a period of approximately 16 months. Construction phases would include demolition, site preparation, 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.

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City use best available noise suppression devices and techniques and limit construction hours near residential uses per the Municipal Code allowable hours, which are between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday when construction occurs within 500 feet of a residential land use. Further, the City considers significant construction noise impacts to occur if a project that is 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. While the City of San José does not establish noise level thresholds for construction activities, this analysis uses the noise limits established by the Federal Transit Administration (FTA) to identify the potential for impacts due to substantial temporary construction noise. The FTA identifies construction noise limits in the *Transit Noise and Vibration Impact Assessment Manual*.[1] During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be applied at residential land uses and 90 dBA L_{eq} shall be applied at commercial and industrial land uses.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The hauling of excavated materials and construction materials would generate truck trips on local roadways, as well. For the proposed project, pile driving, which generates excessive noise levels, is not expected. 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 are about 72 to 88 dBA L_{eq} for residential mixed-use 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 result in lower construction noise levels at distant receptors.

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.

Equipment expected to be used in each construction stage are summarized in Table 7, along with the quantity of each type of equipment and the reference noise level at 50 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 hourly average noise levels for each phase of construction, assuming the two loudest pieces of equipment would operate simultaneously, as recommended by the 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 or building façades of the surrounding land uses. 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.

TABLE 7 Estimated Construction Noise Levels for the Proposed Mixed-Use Building at a Distance of 50 feet

Phase of Construction	Total Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 50 feet
Demolition	28 days	Concrete/Industrial Saw (1)[a] Excavator (3) Rubber-Tired Dozer (2)[a]	84 dBA L_{eq}
Site Preparation	15 days	Rubber-Tired Dozer (3)[a] Tractor/Loader/Backhoe (4)[a]	82 dBA L_{eq}
Grading/Excavation	25 days	Excavator (1) Grader (1)[a] Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (3)[a]	84 dBA L_{eq}
Trenching/Foundations	20 days	Tractor/Loader/Backhoe (1)[a] Excavator (1)[a]	82 dBA L_{eq}
Building – Exterior	260 days	Crane (1) Forklift (3) Generator Set (1)[a] Tractor/Loader/Backhoe (3)[a] Welder (1)	82 dBA L_{eq}
Building – Interior/ Architectural Coating	40 days	Air Compressor (1)[a]	74 dBA L_{eq}
Paving	40 days	Paver (2)[a] Paving Equipment (2)[a] Roller (2)	83 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 Future Mixed-Use Building (100ft)	**South Residential (100ft)**	**Northeast Residential & Commercial (65ft)**	**East Residential & Commercial (195ft)**	**North Residential (260ft)**
Demolition	78 dBA L_{eq}	78 dBA L_{eq}	82 dBA L_{eq}	72 dBA L_{eq}	70 dBA L_{eq}
Site Preparation	76 dBA L_{eq}	76 dBA L_{eq}	80 dBA L_{eq}	70 dBA L_{eq}	68 dBA L_{eq}
Grading/Excavation	78 dBA L_{eq}	78 dBA L_{eq}	81 dBA L_{eq}	72 dBA L_{eq}	69 dBA L_{eq}
Trenching/Foundations	76 dBA L_{eq}	76 dBA L_{eq}	79 dBA L_{eq}	70 dBA L_{eq}	67 dBA L_{eq}
Building – Exterior	76 dBA L_{eq}	76 dBA L_{eq}	80 dBA L_{eq}	70 dBA L_{eq}	68 dBA L_{eq}
Building – Interior/ Architectural Coating	68 dBA L_{eq}	68 dBA L_{eq}	71 dBA L_{eq}	62 dBA L_{eq}	59 dBA L_{eq}
Paving	77 dBA L_{eq}	77 dBA L_{eq}	81 dBA L_{eq}	71 dBA L_{eq}	69 dBA L_{eq}

As shown in Table 8, construction noise levels would intermittently range from 59 to 82 dBA L_{eq} when focused near the center of the project site. These construction noise levels would potentially exceed the exterior threshold of 80 dBA L_{eq} at residential land uses adjoining the site in the northeast corner of the project site, while the 90 dBA L_{eq} threshold for commercial land uses is not expected to be exceeded in the project vicinity during project construction. Additionally, specific construction activities would at times exceed these thresholds when work is conducted near shared property lines. Since project construction would last for a period of more than one year and considering that the project site is within 500 feet of existing residential uses and within 200 feet of existing commercial uses, this temporary construction impact would be considered significant in accordance with Policy EC-1.7 of the City's General Plan.

Mitigation Measure 1a:

For large or complex projects, Policy EC-1.7 of the City's General Plan requires 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. Additionally, the City requires that reasonable noise reduction measures be incorporated into the construction plan and implemented during all phases of construction activity as part of their Standard Permit Condition. The following measures shall be included as part of the proposed project construction:

- Limit construction to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for any on-site or off-site work within 500 feet of any residential unit. Construction outside of these hours may be approved through a development permit based on a site-specific "construction noise mitigation plan" and a finding by the Director of Planning, Building and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- Construct solid plywood fences around ground level construction sites adjacent to operational businesses, residences, or other noise-sensitive land uses.

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

- Prohibit unnecessary idling of internal combustion engines.

- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.

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

- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent land uses and nearby residences.

- If complaints are received or excessive noise levels cannot be reduced using the measures above, erect a temporary noise control blanket barrier along surrounding building facades that face the construction sites.

- Designate a "disturbance coordinator" who shall be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., bad muffler, etc.) and shall 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 it in the notice sent to neighbors regarding the construction schedule.

With the implementation of GP Policy EC-1.7, Municipal Code requirements, and the City's Standard Permit Conditions mentioned above, the temporary construction noise impact would be reduced to a less-than-significant level.

Impact 1b: **Permanent Noise Level Increase/Exceed Applicable Standards.** The proposed project would not result in a substantial permanent noise level increase at receptors in the project vicinity. Operational noise levels generated by the proposed project could potentially exceed applicable standards at the future noise-sensitive receptors west of the project site. This is a **less-than-significant** impact with the incorporation of the City's standard conditions of approval for mechanical equipment.

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if the project would substantially increase noise levels at existing sensitive receptors in the project vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL at residences; or b) the noise level increase is 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater at residences. Noise levels at sensitive land uses exceed 60 dBA DNL; therefore, a significant impact would occur if traffic or operational noise due to the proposed project would permanently increase ambient levels by 3 dBA DNL.

Under the City's Noise Element, noise levels from nonresidential building equipment shall not exceed a noise level of 55 dBA DNL at receiving noise-sensitive land uses. While the proposed project does include a residential component, the mixed-use building equipment would be used by both the residential and commercial uses; conservatively, Policies EC-1.3 and EC-1.6 shall be enforced for the proposed project.

The City's General Plan does not include thresholds for equipment noise generated at residential buildings; however, the Municipal Code requires mechanical equipment noise to be maintained at or below 55 dBA at receiving residential properties when operational noise is generated at residential

uses. Additionally, Section 20.40.600 of the Municipal Code includes a noise limit of 60 dBA on receiving commercial uses.

Project Traffic Increase

The traffic study included peak hour turning movements for existing traffic volumes and project trips at eight intersections in the vicinity of the project site and the project driveway along Willard Avenue. The project trips were added to the existing volumes to estimated existing plus project traffic volumes. 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 1 dBA DNL or below along all segments in the project vicinity. The project would not result in a permanent noise increase of 3 dBA DNL or more at noise-sensitive receptors in the project vicinity.

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

Roadway	Segment	Estimated Traffic Noise Increase with Project Trips
Leigh Avenue	South of Scott Street	0 dBA DNL
	Scott Street to West San Carlos Street	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL
Scott Street	West of Leigh Avenue	0 dBA DNL
	East of Leigh Avenue	0 dBA DNL
West San Carlos Street	West of Leigh Avenue	0 dBA DNL
	Leigh Avenue to Buena Vista Avenue	0 dBA DNL
	Buena Vista Avenue to Willard Avenue	0 dBA DNL
	Willard Avenue to Muller Place	0 dBA DNL
	Muller Place to Meridian Avenue	0 dBA DNL
	Meridian Avenue to Race Street	0 dBA DNL
	East of Race Street	0 dBA DNL
Buena Vista Avenue	South of West San Carlos Street	1 dBA DNL
	North of West San Carlos Street	1 dBA DNL
Willard Avenue	South of Project Driveway	0 dBA DNL
	Project Driveway to West San Carlos Street	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL
Muller Place	North of West San Carlos Street	1 dBA DNL
Meridian Avenue	South of Douglas Avenue	0 dBA DNL
	Douglas Avenue to West San Carlos Street	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL

Roadway	Segment	Estimated Traffic Noise Increase with Project Trips
Race Street	South of West San Carlos Street	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL
Douglas Street	West of Meridian Avenue	0 dBA DNL

Mechanical Equipment

Utility closets are shown on the ground level of the proposed building; however, the building façade would provide adequate attenuation for any noise-generating mechanical equipment potentially located within these rooms. Noise levels generated by ground-level mechanical equipment would not exceed the City's General Plan and Municipal Code threshold of 55 dBA DNL at the existing residential land uses surrounding the project site. For all existing receptors, the noise level increase due to mechanical equipment noise would not be measurable or detectable (0 dBA DNL increase).

The roof plan shows a potential area for solar panels at the rear of the building, which would not generate audible noise at the project boundaries. The potential solar panels would not exceed the City's thresholds at receiving property lines or generate a measurable or detectable noise level increase (0 dBA DNL increase).

Typically, heating, ventilation, and air conditioning (HVAC) equipment would be for mixed-use buildings would be located on the roof. These types of units typically cycle on and off continuously throughout a 24-hour period. This means that, at any given time, multiple units could be operating simultaneously in a relatively small vicinity of the rooftop. Typical heating pumps would generate noise ranging from 56 to 66 dBA at a distance of 3 feet. Assuming up to eight heating pumps would run simultaneously at any given time, hourly average noise levels would range from 65 to 75 dBA L_{eq} at a distance of 3 feet. Additionally, air handling units for buildings of this size typically generate noise levels up to 62 dBA at a distance of 20 feet. Assuming up to eight air handling units would operate simultaneously at any given time, noise levels generated by the air handling units would be up to 71 dBA L_{eq} at 20 feet. When combined with the heating pumps, hourly average noise levels for the worst-case scenario would be up to 88 dBA L_{eq} at 3 feet.

The elevation of the rooftop equipment would provide at least 20 dBA reduction for all existing receptors that are one- or two-story buildings, which include receptors adjoining the site to the south and to the northeast, as well as the receptors east of Willard Avenue. The residential building to the north of the site, opposite West San Carlos Street, is four-stories tall. With the elevation of the rooftop of the proposed building and the setback of the equipment from the edge of the building, the attenuation would be a minimum of 10 dBA. The future receptors to the west would consist of a mixed-use, seven-story residential building. Therefore, these future receptors would potentially be exposed to direct line-of-sight to rooftop equipment. For worst-case conditions, this would result in no attenuation.

Table 10 shows the estimated mechanical equipment noise propagated to the surrounding land uses.

TABLE 10 Estimated Operational Noise Levels for the Rooftop Equipment

Receptor	Distance from Rooftop Equipment	Hourly L_{eq}, dBA	DNL, dBA	Noise Level Increase, dBA DNL
West Future Mixed-Use	30 feet	Up to 68	74	N/A[c]
South Residential	60 feet	Up to 42[a]	48[a]	0
Northeast Residential & Commercial	50 feet	Up to 43[a]	50[a]	0
East Residential & Commercial	65 feet	Up to 41[a]	47[a]	0
North Residential	155 feet	Up to 44[b]	50[b]	0

[a] A conservative 20 dBA reduction was applied to the noise levels due to the elevation of the rooftop equipment for existing one- and two-story receptors.
[b] A conservative 10 dBA reduction was applied to the noise levels due to the elevation of the rooftop equipment for existing four-story receptors.
[c] Since future receptors do not currently exist, they would not be subject to a noise level increase under future conditions.

Based on the estimated noise levels in Table 10, mechanical equipment noise levels are not expected to exceed the City's General Plan and Municipal Code threshold of 55 dBA DNL at the existing land uses to the south, to the east, and to the west. At the future receptors to the west, however, noise levels would potentially exceed the City's thresholds. For all existing receptors in the project vicinity, the noise level increase due to mechanical equipment noise would not be measurable or detectable (0 dBA DNL increase).

Truck Loading and Unloading

The site plan shows a ground-level loading zone along the eastern building façade. All existing receptors to the west, to the south, to the northeast, and to the north would be well shielded from truck loading activities. However, the commercial and residential receptors to the east would be exposed to truck delivery noise at the loading dock. The surrounding receptors would be partially shielded from truck delivery noise due to the building surrounding the loading dock on three sides, with limited exposure at the entrance to the loading area, assuming the door to be open. The building façades surrounding the loading area would provide a minimum 5 dBA attenuation for the surrounding area, assuming the door to the loading zone to be open. Further, it is assumed that all deliveries and on-site maintenance activities would occur during daytime hours between 7:00 a.m. and 10:00 p.m.

For commercial uses of this size and residential uses, medium-sized trucks or vendor trucks would be expected at the project site. 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. Medium trucks used for incoming deliveries typically generate maximum instantaneous noise levels of 60 to 65 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. Assuming a maximum of one 15-minute delivery in any given hour, hourly average noise levels due to truck maneuvering would be about 59 dBA L_{eq} at 50 feet.

The nearest receptors to the east would be 65 feet from the center of the loading zone. Assuming a conservative attenuation of 5 dBA, the east residential and commercial uses would be exposed to hourly average noise levels of 52 dBA L_{eq} during truck deliveries, and assuming up to two deliveries in a single day during daytime hours only, the day-night average noise level would be 41 dBA DNL.

Truck deliveries occurring at the proposed project site would not be expected to generate levels exceeding the City's thresholds at the nearby noise-sensitive land uses. For all existing receptors, the noise level increase due to truck delivery noise would not be measurable or detectable (0 dBA DNL increase).

Total Combined Project-Generated Noise

The operational noise levels produced by the proposed project combined (i.e., traffic, mechanical equipment, and truck deliveries) would result in an increase of 1 dBA DNL or less at all existing noise-sensitive receptors in the project vicinity. Therefore, the proposed project would not result in a substantial increase over ambient noise levels in the project vicinity. However, operational noise levels due to mechanical equipment located on the rooftop of the proposed building could potentially exceed 55 dBA DNL at the nearest future mixed-use building west of the site. This would be a potentially significant impact.

Mitigation Measure 1b:

The final design plans should be reviewed by a qualified acoustical consultant to address any potential conflicts with the General Plan or Municipal Code. The City's standard permit condition shall be implemented as condition of approval for the proposed project. The standard permit condition states the following:

> A detailed acoustical study shall be prepared during final building design to evaluate the potential noise generated by building mechanical equipment and demonstrate the necessary noise control to meet the City's 55 dBA DNL goal. Noise control features such as sound attenuators, baffles, and barriers shall be identified and evaluated to demonstrate that mechanical equipment noise would not exceed 55 dBA DNL at noise-sensitive locations around the project site. The noise control features identified by the study shall be incorporated into the project prior to issuance of a building permit.

Impact 2: **Exposure to Excessive Groundborne Vibration.** Construction-related vibration levels would potentially 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 be required for the proposed project.

According to the City's Historic Resource Inventory,[3] historical structures are identified at 328 Mayellen Avenue and 319 Page Street. Both of these sites are 300 feet or more from the project site boundaries. No historical buildings have been identified within 200 feet of the project site.

Policy EC-2.3 of the City of San José General Plan states that a vibration limit of 0.08 in/sec PPV shall be used to minimize the potential for cosmetic damage to sensitive historical structures, and a vibration limit of 0.20 in/sec PPV shall be used to minimize damage at buildings of normal conventional construction. The vibration limits contained in this policy are conservative and designed to provide the ultimate level of protection for existing buildings in San José. As discussed in detail below, vibration levels exceeding these thresholds would be capable of cosmetically damaging adjacent buildings. Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

Table 11 presents typical vibration levels that could be expected from 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. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet.

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 11 also summarizes the distances to the 0.08 in/sec PPV threshold for historical buildings and to the 0.2 in/sec PPV threshold for all other buildings. Since the historical buildings identified above are located 300 feet or more from the project site, vibration levels of 0.08 in/sec PPV or more at historical structures in the project vicinity are not expected. Historical buildings are not discussed further in this report.

[3] www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/historic-preservation/historic-resources-inventory

TABLE 11 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet 0.08 in/sec PPV (feet)	Minimum Distance to Meet 0.2 in/sec PPV (feet)
Clam shovel drop		0.202	59	26
Hydromill (slurry wall)	in soil	0.008	4	2
	in rock	0.017	7	3
Vibratory Roller		0.210	61	27
Hoe Ram		0.089	28	13
Large bulldozer		0.089	28	13
Caisson drilling		0.089	28	13
Loaded trucks		0.076	24	11
Jackhammer		0.035	12	6
Small bulldozer		0.003	2	<1

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., October 2022.

Table 12 summarizes the vibration levels at nearest surrounding conventional 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 12), 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 11 was operating along the nearest boundary of the project site, which would represent the worst-case scenario.

Project construction activities would potentially generate vibration levels up to 0.6 in/sec PPV at the nearest future and existing buildings adjoining the project site to the west, to the south, and to the northeast. A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[4] The findings of this study have been applied to buildings affected by construction-generated vibrations.[5] As reported in USBM RI 8507[4] and reproduced by Dowding,[5] Figure 2 presents the damage probability, in terms of "threshold damage" (described above as cosmetic damage), "minor damage," and "major damage," at varying vibration levels. Threshold damage, or cosmetic damage, would entail hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage

[4] 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.

[5] Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

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 2, maximum vibration levels of 0.2 in/sec PPV or lower would result in virtually no measurable damage, while maximum vibration levels of 0.6 in/sec PPV would result in less than 8% chance of cosmetic damage. No minor or major damage would be expected at the buildings immediately adjoining the project site.

Neither cosmetic, minor, or major damage would occur at historical or conventional buildings located 60 feet or more from the project site. 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.

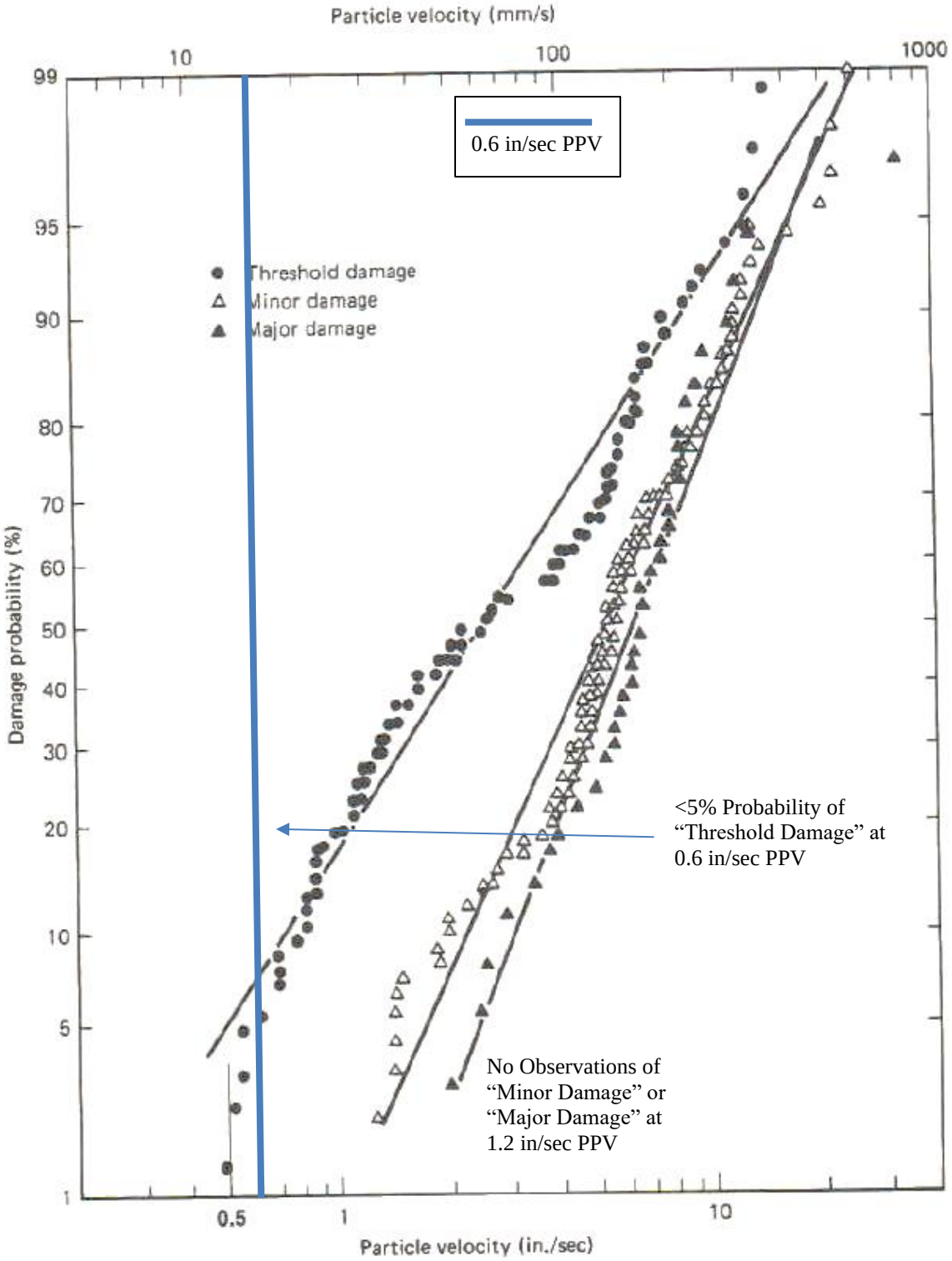
In summary, the construction of the project would not exceed the General Plan threshold of 0.08 in/sec PPV at the nearest historical buildings; however, construction activities would potentially generate vibration levels exceeding the 0.2 in/sec PPV threshold at nonhistorical properties adjoining the project site. This would be a potentially significant impact.

TABLE 12 Vibration Source Levels for Construction Equipment

Equipment		PPV (in/sec)				
		West Future Mixed-Use Building (within 10ft)	**South Residential Building (within 10ft)**	**Northeast Residential Building (within 10ft)**	**East Residential & Commercial Building (45ft)**	**North Residential Building (115ft)**
Clam shovel drop		**0.553**	**0.553**	**0.553**	0.106	0.038
Hydromill (slurry wall)	in soil	0.022	0.022	0.022	0.004	0.001
	in rock	0.047	0.047	0.047	0.009	0.003
Vibratory Roller		**0.575**	**0.575**	**0.575**	0.110	0.039
Hoe Ram		**0.244**	**0.244**	**0.244**	0.047	0.017
Large bulldozer		**0.244**	**0.244**	**0.244**	0.047	0.017
Caisson drilling		**0.244**	**0.244**	**0.244**	0.047	0.017
Loaded trucks		**0.208**	**0.208**	**0.208**	0.040	0.014
Jackhammer		0.096	0.096	0.096	0.018	0.007
Small bulldozer		0.008	0.008	0.008	0.002	0.001

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., October 2022.

FIGURE 2 Probability of Cracking and Fatigue from Repetitive Loading



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

Mitigation Measure 2:

In addition to the measures provided in Mitigation Measure 1a, the City shall require reasonable vibration reduction measures be incorporated into the construction plan and implemented during all phases of construction when activities occur within 30 feet of the adjoining buildings. The following measures shall be included as part of the proposed project construction to reduce vibration levels for construction occurring within 30 feet of adjoining buildings:

- A list of all heavy construction equipment to be used for this project known to produce high vibration levels (e.g., tracked vehicles, vibratory compaction, jackhammers, hoe rams, clam shovel drop, and vibratory roller, etc.) shall be submitted to the City by the contractor. This list shall be used to identify equipment and activities that would potentially generate substantial vibration and to define the level of effort for reducing vibration levels below the thresholds.

- Place operating equipment on the construction site as far as possible from vibration-sensitive receptors.

- Use smaller equipment to minimize vibration levels to below 0.2 in/sec PPV shall be used at the property lines. For example, a smaller vibratory roller, such as the Caterpillar model CP433E vibratory compactor, could be used when compacting materials within 30 feet of the adjacent buildings.

- Avoid using vibratory rollers and clam shovel drops near sensitive areas.

- Select demolition methods not involving impact tools.

- Modify/design or identify alternative construction methods to reduce vibration levels below the limits.

- Avoid dropping heavy equipment and use alternative methods for breaking up existing pavement, such as a pavement grinder, instead of dropping heavy objects, within 30 feet of the adjacent buildings.

- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

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 about 1.9 miles from Norman Y. Mineta International Airport. The noise environment attributable to aircraft is considered normally acceptable under the Santa Clara County ALUC noise compatibility policies for residential land uses. This is a **less-than-significant** impact.

Norman Y. Mineta San José International Airport is a public-use airport located about 1.9 miles northeast of the project site. According to the City's new Airport Master Plan Environmental Impact Report,[6] the project site lies outside the 60 dBA CNEL/DNL contour line (see Figure 3). According to Policy EC-1.11 of the City's General Plan, the required safe and compatible threshold for exterior noise levels would be at or below 65 dBA CNEL/DNL for aircrafts. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

The future interior noise levels resulting from aircraft would below 45 dBA DNL. Therefore, future interior noise at the proposed building would be compatible with aircraft noise. This would be a less-than-significant impact.

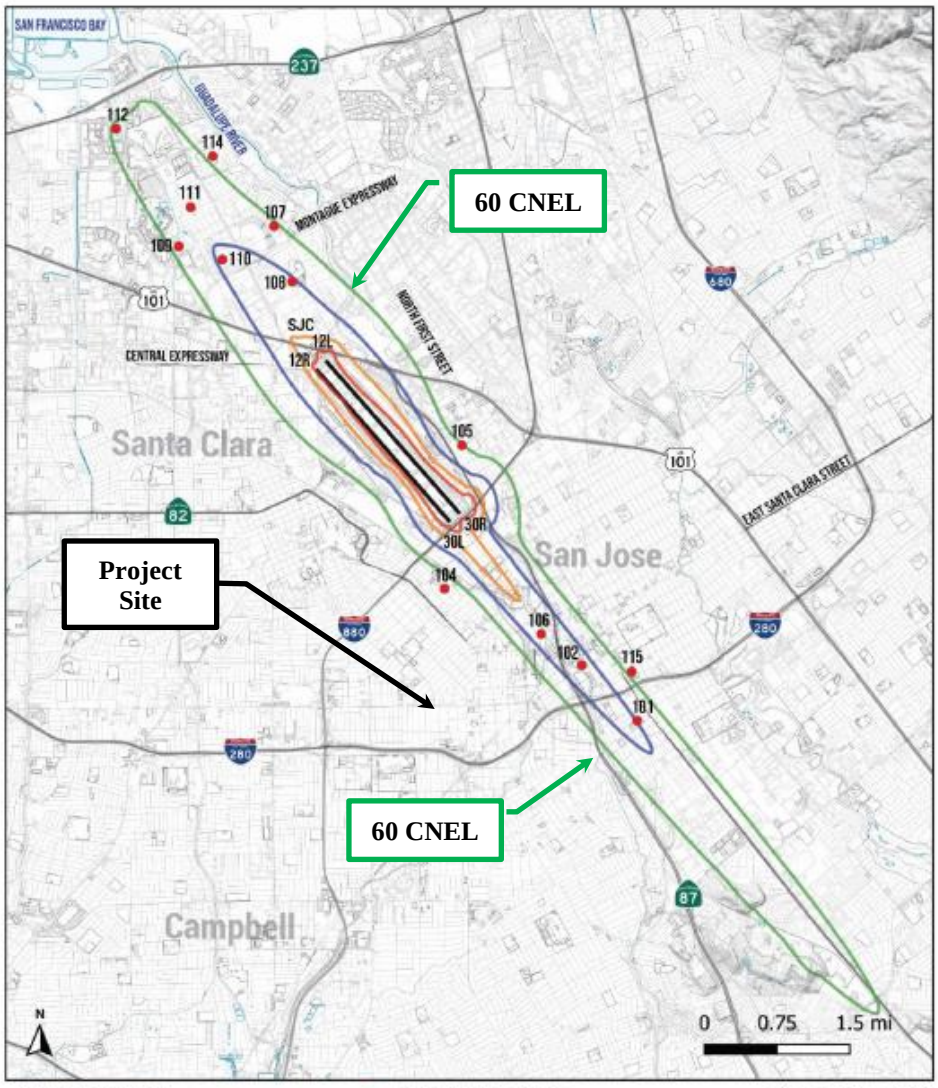
Mitigation Measure 3: **No further mitigation required.**

[6] David J. Powers & Associates, Inc., Integrated Final Environmental Impact Report, Amendment to Norman Y. Mineta San Jose International Airport Master Plan, April 2020.

FIGURE 3 2037 CNEL Noise Contours for SJIA Relative to Project Site

Figure 5
Scenario 2: With Project 2037 Noise Contour Map

SAN JOSE INTERNATIONAL AIRPORT | Environmental Impact Report FINAL | October 2019



NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

- Noise Monitoring Station
- 101 Site ID
- Runway
- 75 dBA and Greater CNEL Contour
- 70 dBA and Greater CNEL Contour
- 65 dBA and Greater CNEL Contour
- 60 dBA and Greater CNEL Contour

Figure 5 Scenario 2: With Project 2037 Noise Contour Map

Source: BridgeNet International 2019

Cumulative Impacts

Cumulative noise impacts would include temporary construction noise from cumulative construction projects and cumulative traffic noise increases.

From the City's website,[7] the following planned or approved projects are located within 1,000 feet of the proposed project:

- **West San Carlos Mixed-Use** – this project adjoins the project site to the west and is located at 1530 West San Carlos Street. This approved project would consist of a seven-story mixed-use apartment building, one five-story affordable housing building, and 15,582 square feet of commercial space. As an approved project, it is assumed that this project would be constructed before construction begins at 1520 West San Carlos Street. Therefore, cumulative construction is not assumed at this time.

- **Page Street** – this project is located at 329 Page Street, approximately 370 feet east of the project site. This six-story residential building is currently under construction and would be complete before construction starts at 1520 West San Carlos Street. Therefore, cumulative construction is not assumed at this time.

- **259 Meridian Avenue** – this project is located approximately 720 feet northeast of the project site. This approved project would include the construction of 241 residential units. As an approved project, it is assumed that this project would be constructed before construction begins at 1520 West San Carlos Street. Therefore, cumulative construction is not assumed at this time.

No other planned or proposed projects are located within 1,000 feet of the project site. Therefore, there would not be any cumulative construction impacts.

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 DNL or greater, with a future noise level of less than 60 dBA DNL, or of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater, compared to existing traffic volumes; and 2) if the cumulative plus project traffic volumes result in a 1 dBA DNL 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 are 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 purposes 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, in addition to the project driveway at Willard Avenue. Table 13 summarizes the noise level difference calculated by comparing both

[7] https://gis.sanjoseca.gov/maps/devprojects/

the background (no project) and background plus project traffic scenarios to the existing scenario. As shown in Table 13, the background (no project) and background plus project scenarios would not result in a noise level increase of 3 dBA DNL or more. Therefore, the first criteria for a cumulative traffic noise increase would not be met. There would not be a cumulative noise level increase.

TABLE 13 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		Cumulative Contribution
		Background	Background Plus Project	
Leigh Avenue	South of Scott Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
	Scott Street to West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
Scott Street	West of Leigh Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
	East of Leigh Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
West San Carlos Street	West of Leigh Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
	Leigh Avenue to Buena Vista Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
	Buena Vista Avenue to Willard Avenue	1 dBA DNL	1 dBA DNL	0 dBA DNL
	Willard Avenue to Muller Place	1 dBA DNL	1 dBA DNL	0 dBA DNL
	Muller Place to Meridian Avenue	1 dBA DNL	1 dBA DNL	0 dBA DNL
	Meridian Avenue to Race Street	1 dBA DNL	1 dBA DNL	0 dBA DNL
	East of Race Street	1 dBA DNL	1 dBA DNL	0 dBA DNL
Buena Vista Avenue	South of West San Carlos Street	0 dBA DNL	1 dBA DNL	1 dBA DNL
	North of West San Carlos Street	0 dBA DNL	1 dBA DNL	1 dBA DNL
Willard Avenue	South of Project Driveway	0 dBA DNL	0 dBA DNL	0 dBA DNL
	Project Driveway to West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
Muller Place	North of West San Carlos Street	0 dBA DNL	1 dBA DNL	1 dBA DNL
Meridian Avenue	South of Douglas Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
	Douglas Avenue to West San Carlos Street	1 dBA DNL	1 dBA DNL	0 dBA DNL
	North of West San Carlos Street	1 dBA DNL	1 dBA DNL	0 dBA DNL

Roadway	Segment	Estimated Noise Level Increase Over Existing Volumes		Cumulative Contribution
		Background	Background Plus Project	
Race Street	South of West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
	North of West San Carlos Street	0 dBA DNL	0 dBA DNL	0 dBA DNL
Douglas Street	West of Meridian Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL

APPENDIX A

FIGURE A1 Daily Trend in Noise Levels for LT-1, Wednesday, October 27, 2021

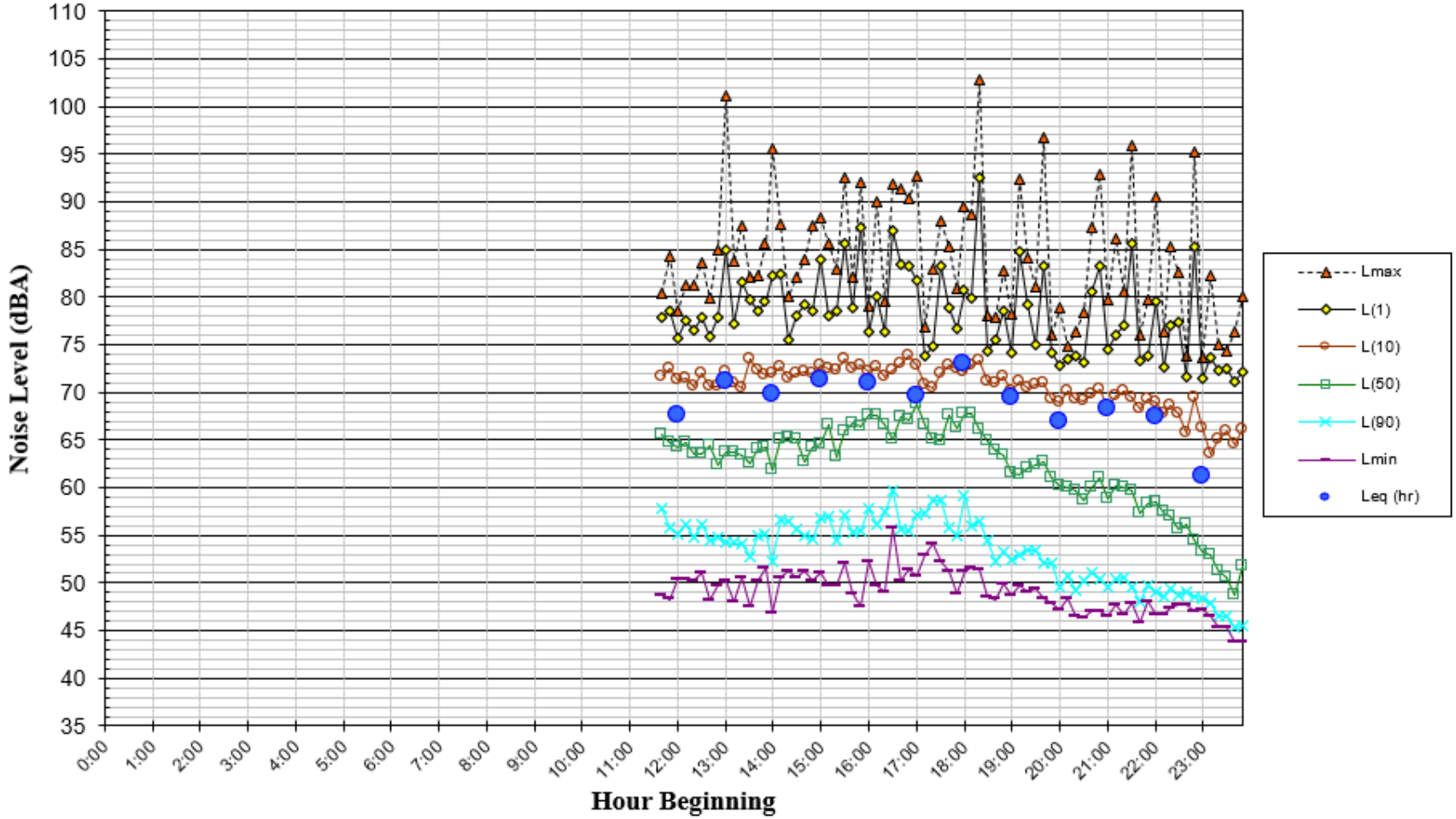


FIGURE A2 Daily Trend in Noise Levels for LT-1, Thursday, October 28, 2021

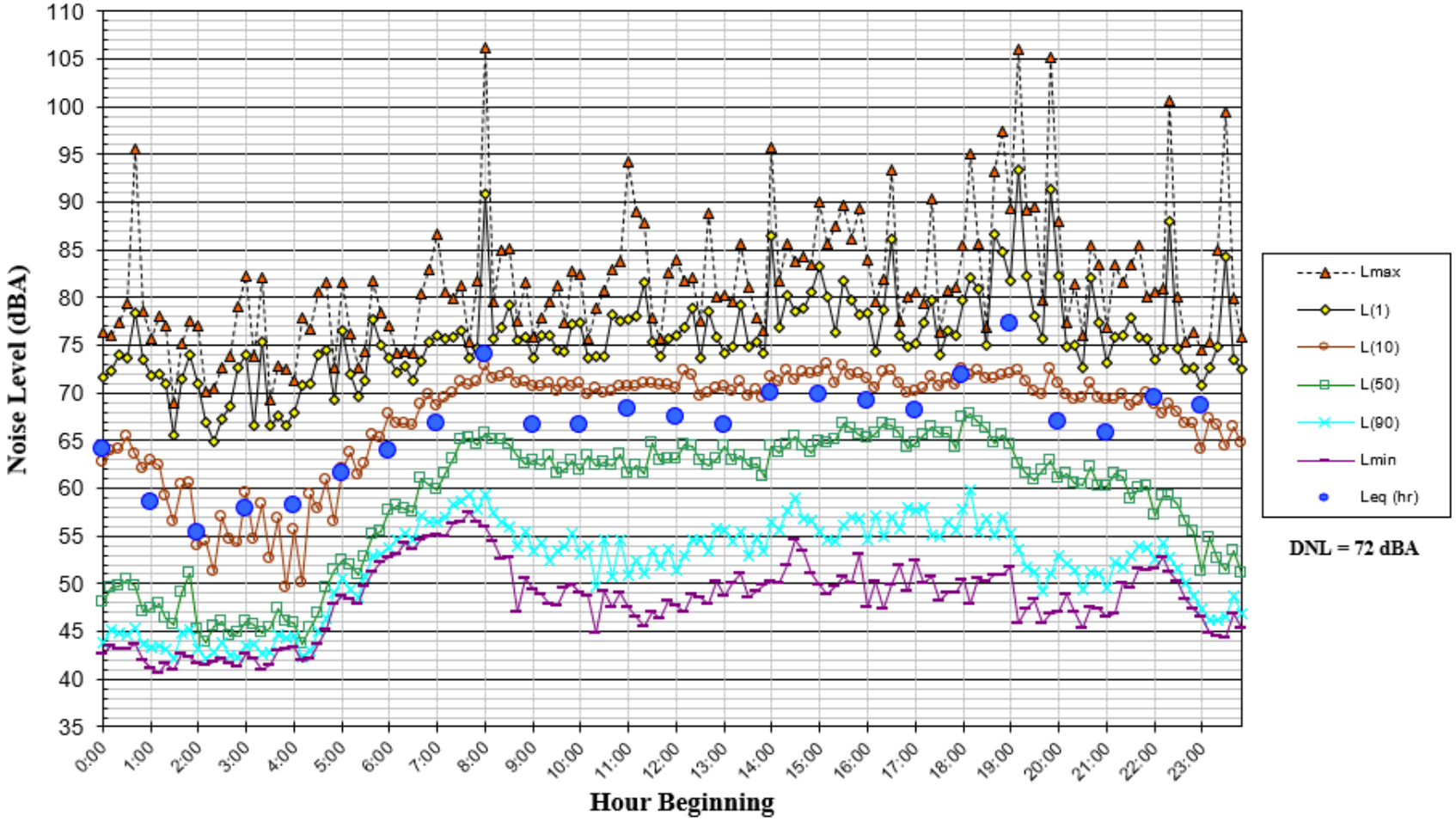


FIGURE A3 Daily Trend in Noise Levels for LT-1, Friday, October 29, 2021

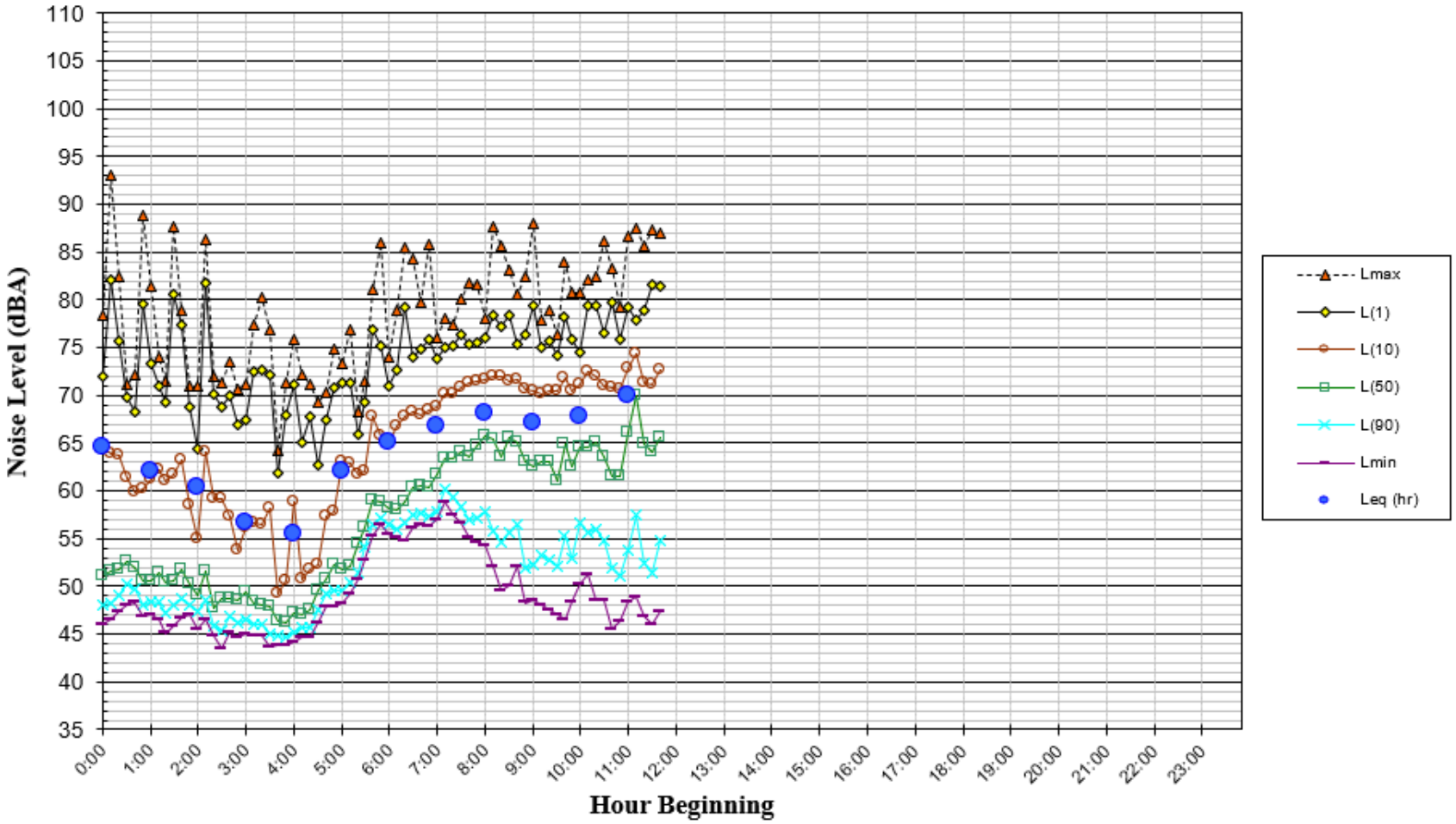


FIGURE A4 Daily Trend in Noise Levels for LT-2, Wednesday, October 27, 2021

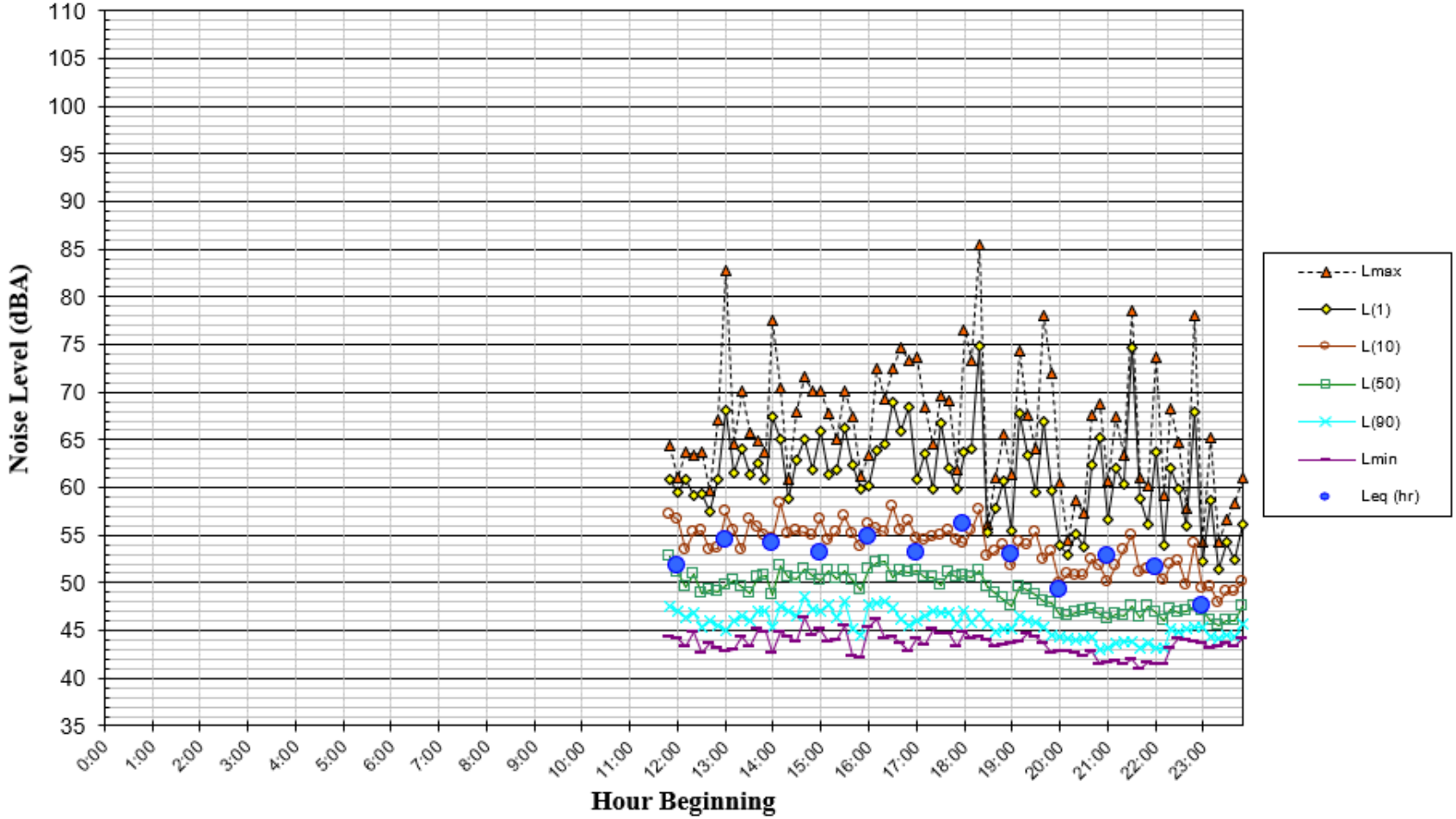


FIGURE A5 Daily Trend in Noise Levels for LT-2, Thursday, October 28, 2021

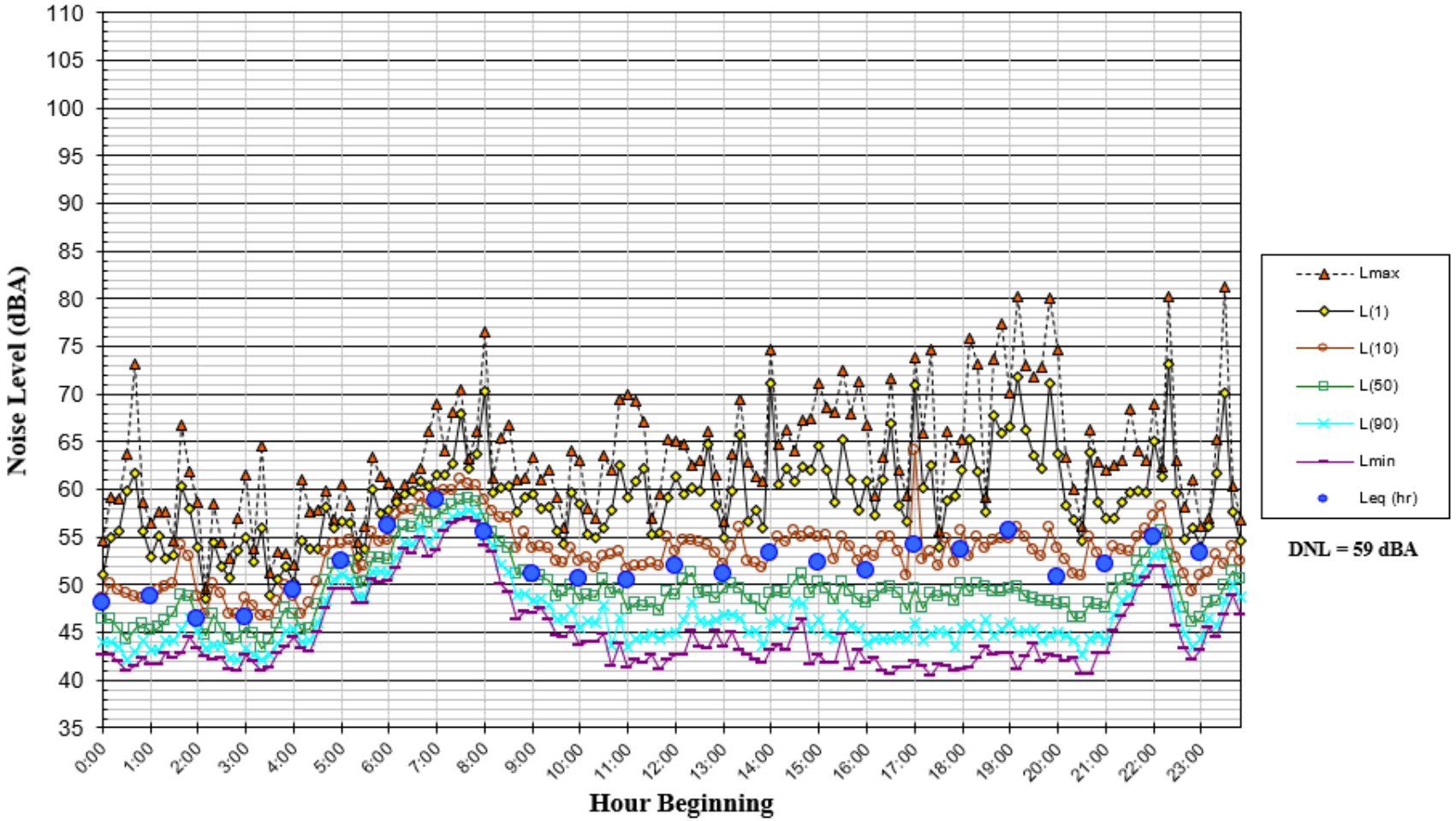


FIGURE A6 Daily Trend in Noise Levels for LT-2, Friday, October 29, 2021