Appendix G: Noise and Vibration Analysis

BLOSSOM HILL STATION TOD PROJECT
NOISE AND VIBRATION ASSESSMENT

San José, California

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INTRODUCTION

A new mixed-use building and a new residential building are proposed at a site north of Blossom Hill Road and southwest of State Route 85 (SR 85) in San José, California. The mixed-use building (Building A) would include up to 13,590 square feet (sf) of commercial space and up to 239 residential units. During the initial noise and vibration study, three options were proposed for Building A: Option 1 would consist of 10,775 square feet of commercial space and 239 residential units; Option 2 would consist of 22,595 square feet of commercial space and 231 residential units; and Option 3 would consist of 15,000 square feet of commercial space and 239 residential units. In all three configurations, Building A would be six stories tall, with a maximum height of 79.6 feet, including mechanical screening. The residential building (Building B) would also be six stories tall, with a maximum height of 72 feet, including mechanical screening. Building B would include 89 affordable housing units. For purposes of assessing the worst-case scenario, this noise report assumed the maximum commercial space of 22,595 square feet and the maximum number of residential units (328). However, the applicant has since confirmed 13,590 sf of commercial space would be proposed by the project. Since this report represents the worst-case scenario, all results included in this study would apply to the chosen scenario.

As part of the project, approximately half of the existing parking lot and associated landscaping along Blossom Hill Road would be removed. The existing bus stop would be relocated to Blossom Hill Road. The proposed project would retain the light rail station and retain but reconfigure 212 parking spaces in the northern half of the project site. The project site would be accessed along Blossom Hill Road.

Additionally, a walking trail extension along the western boundary of the project site would be constructed. This portion of the project is assessed at a program-level and not as part of the proposed development project.

This report evaluates the project's potential to result in significant noise and vibration 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, summarizes applicable regulatory criteria, and describes the ambient noise environment at the site and surrounding area; 2) the General Plan Consistency 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 measures, where necessary, to mitigate the impacts of the project on sensitive receptors in the vicinity.

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 about 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* (L_{dn} or *DNL*) 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.

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 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.

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, September 2013.

Regulatory Background - Noise

The State of California, Santa Clara County, and the City of San José have established regulatory criteria that are applicable in this assessment. The State CEQA Guidelines, Appendix G, California Building Code, Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan, and the City of San José General Plan are used to assess the potential significance of impacts. A summary of the applicable regulatory criteria is provided below.

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

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels; or

(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.

Pursuant to recent court decisions, the impacts of site constraints, such as exposure of the proposed project to excessive levels of noise and vibration, are not included in the Impacts and Mitigation Section of this report. These items are discussed in a separate section addressing the project's consistency with the policies set forth in the City's General Plan.

CEQA does not define what noise level increase would be considered substantial. Typically, an increase in the DNL noise level resulting from the project at noise sensitive land uses of 3 dBA or greater would be considered a significant impact when projected noise levels would exceed those considered acceptable for the affected land use. An increase of 5 dBA DNL or greater would be considered a significant impact when projected noise levels would remain within those considered acceptable for the affected land use.

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 2010 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). These standards were not altered in the 2019 revisions. Section 5.507 states that either the prescriptive (Section 5.507.4.1) or the performance method (Section 5.507.4.2) shall be used to determine environmental control at indoor areas. The prescriptive method is very conservative and not practical in most cases; however, the performance method can be quantitatively verified using exterior-to-interior calculations. For the purposes of this report, the performance method is utilized to determine consistency with the Cal Green Code. Both of 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 or additional envelope or altered 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 within the 65 dBA CNEL or DNL noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the Noise Element of the General Plan.
>
> **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 or addition envelope or altered 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.

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan. The Comprehensive Land Use Plan 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

Policy N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (2022 Aircraft Noise Contours).

Policy N-4 No residential or transient lodging construction shall be permitted within the 65 dB CNEL contour boundary unless it can be demonstrated that the resulting interior sound levels will be less than 45 dB CNEL and there are no outdoor patios or outdoor activity areas associated with the residential portion of a mixed use residential project or a multi-unit residential project. (Sound wall noise mitigation measures are not effective in reducing noise generated by aircraft flying overhead.)

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.

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 San José 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 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 northwest of the SR 85/Blossom Hill Road interchange in San José, California. To the west, the project site is bound by Canoas Creek. Opposite SR 85 to the northeast are existing multi-family residences. To the south, opposite Blossom Hill Road, are single-family residences and a Samaritan Medical Care Center. Additional single-family residences and a 7-Eleven convenience store is west of the project site, opposite Canoas Creek.

The existing noise environment at the project site and in the surrounding area results primarily from vehicular traffic along SR 85 and Blossom Hill Road. Aircraft flyovers associated with Mineta San José International Airport operations also contribute to the noise environment at the site.

Due to the Shelter-in-Place restrictions in the Bay Area at the time of this study, traffic volumes along the surrounding roadways were reduced as compared to typical, pre-pandemic conditions. A noise monitoring survey was not completed to document ambient noise levels during this unique time period because resultant noise levels would be less.

In order to establish the environmental baseline for the project, noise data contained in the City's General Plan Update EIR[1] and noise data from prior projects, including previous projects at the site, were reviewed. The City's General Plan Update EIR includes noise contour data for 2008 (see Figure 1), which show noise levels of 77 dBA DNL at a distance of 75 feet from the centerline of the near lane along SR 85 and 70 dBA DNL at a distance of 75 feet from the centerline of Blossom Hill Road.

Additionally, a noise monitoring survey was completed at the project site between October 18, 2003 and October 22, 2003 for the Housing Element Update Third Phase Housing Opportunity General Plan Amendments EIR Project.[2] The survey included one long-term (LT-1), which was made approximately 170 feet from the centerline of the nearest southbound lane along SR 85. Hourly average noise levels at this location typically ranged from 63 to 68 dBA L_{eq} during the day and from 55 to 66 dBA L_{eq} at night. The day-night average noise level calculated in 2003 ranged from 68 to 69 dBA DNL at LT-1. When propagated to 75 feet, the day-night average noise levels would range from 73 to 74 dBA DNL. Figure A1 of the Appendix show the daily trend in noise levels at LT-1.

Additionally, a noise monitoring survey was completed for a project at 397 Blossom Hill Road between October 5, 2018 and October 10, 2018.[3] The noise environment at this site, which is about 0.6 miles east of the project site, was dominated by Blossom Hill Road, and the monitoring survey

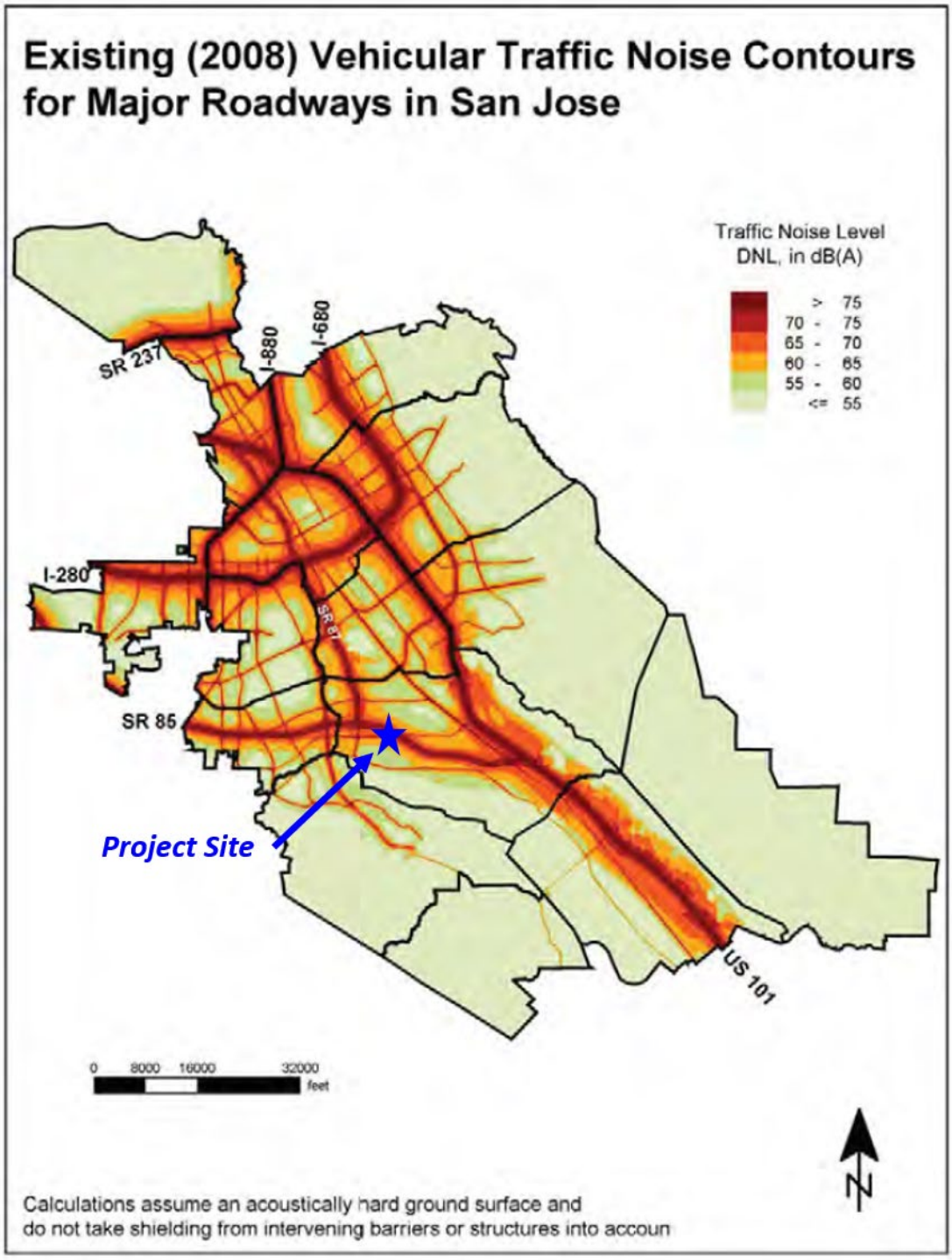
[1] Illingworth & Rodkin, Inc., "Envision San José 2040 General Plan Comprehensive Update Environmental Noise Assessment," December 2010.
[2] Illingworth & Rodkin, Inc., "Environmental Noise Assessment Housing Element Update Third Phase Housing Opportunity General Plan Amendments EIR," January 5, 2004.
[3] Illingworth & Rodkin, Inc., "397 Blossom Hill Road Environmental Noise and Vibration Assessment," February 27, 2019.

included a long-term noise measurement approximately 65 feet from the centerline of the roadway (LT-2). Hourly average noise levels ranged from 63 to 72 dBA L_{eq} during daytime hours, and from 58 to 70 dBA L_{eq} at night. The day-night average noise level at LT-2 ranged from 72 to 73 dBA DNL. Figures A2 through A5 of the Appendix show the daily trend in noise levels at LT-2.

Using existing traffic volumes included in the project traffic report completed by *Hexagon Transportation Consultants, Inc.* in 2020 and in the Caltrans Traffic Census Program,[4] the Federal Highway Administration's Traffic Noise Model (FHWA's TNM), version 2.5, was used to model the existing noise environment at the project site. The vehicle distribution along SR 85 is 98% autos, 1% medium trucks, and 1% heavy trucks, according to the Caltrans census site.[3] Using the same distribution along Blossom Hill Road, the existing noise levels at distances of 75 feet from the centerline of the nearest through lane along southbound SR 85 and 75 feet from the centerline of Blossom Hill Road would be 78 and 72 dBA DNL, respectively. The modeled data correlated well with data and credibly represented worst-case noise levels experienced at the site.

[4] https://dot.ca.gov/programs/traffic-operations/census

FIGURE 1 Existing Noise Contours from the City's General Plan Update EIR



PLAN CONSISTENCY ANALYSIS

The impacts of site constraints, such as exposure of the proposed project to excessive levels of noise, are not considered under CEQA. This section evaluates the Noise and Land Use Compatibility of the project to determine consistency with the policies set forth in the City's General Plan.

Consistency Analysis Thresholds

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 thresholds for exterior and interior spaces included in the General Plan policies are summarized below for the proposed project:

- Exterior noise thresholds for new multi-family residential projects is 60 dBA DNL at usable outdoor activity areas, excluding private balconies and porches.

- For commercial common outdoor use areas, the exterior noise threshold would be 70 dBA DNL.

- The City requires that noise levels within residential units be maintained at 45 dBA DNL or less.

Additionally, the State of California establishes interior noise limits for residential units and all nonresidential land uses as follows:

- The California Building Code establishes an interior noise threshold of 45 dBA DNL for multi-family residential units.

- The Cal Green Code standards specify that interior noise levels attributable to exterior sources not 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.

Noise and Land Use Compatibility

The future noise environment at the project site would continue to result primarily from vehicular traffic along SR 85 and Blossom Hill Road. A traffic report was completed for the proposed project in September 2020 by *Hexagon Transportation Consultants, Inc*. While the traffic study indicated that the proposed project would not substantially increase existing traffic volumes, the traffic study did not provide information related to future traffic volumes. Therefore, to estimate future traffic noise levels, a review of the traffic volumes contained in the *Draft Program EIR for the Envision San José 2040 General Plan,*[5] was made. By the year 2035, a noise level increase of 1 dBA DNL would occur along SR 85, while no measurable increase was calculated along Blossom Hill Road in the General Plan Update EIR. For purposes of assessing the worst-case scenario, a conservative

[5] City of San José, *Draft Program Environmental Impact Report for the Envision San José 2040 General Plan*, State Clearinghouse Number 2009072096, File Number: PP09-011, June 2011.

1% to 2% increase in traffic volumes along Blossom Hill Road was assumed to occur for the next 15 years. This would result in a 1 dBA DNL increase in Blossom Hill Road traffic noise levels by the year 2035. Therefore, the future noise levels estimated at distances of 75 feet from the centerline of the nearest through lane along southbound SR 85 and 75 feet from the centerline of Blossom Hill Road would be 79 and 73 dBA DNL, respectively.

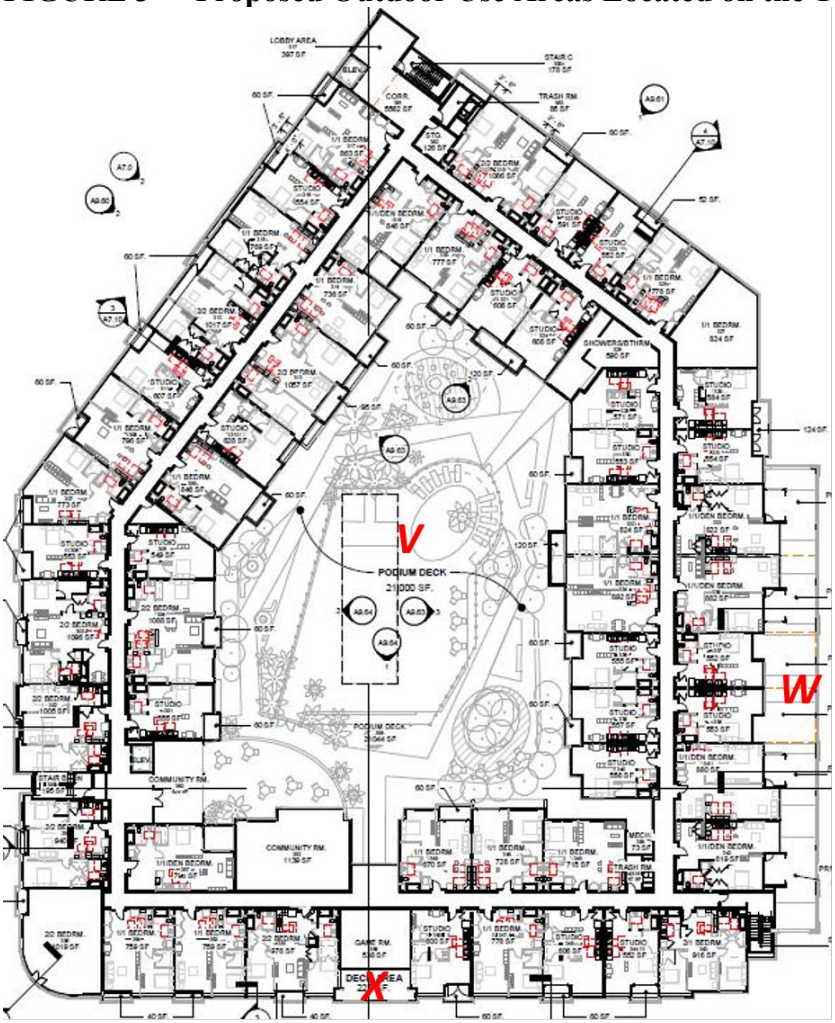
Future Exterior Noise Environment

All ground-level outdoor use areas associated with the proposed project are shown in Figure 2. The outdoor use areas associated with the residential component of the proposed project include the fenced dog walk (identified as L in Figure 2), the outdoor neighborhood amenity space (H), and the affordable building amenity space (C). A retail plaza (identified as K in Figure 2) would be associated with the commercial component of the proposed project.

FIGURE 2 Proposed Outdoor Use Areas Located on the Ground Level

Building A would also include three third-level outdoor use areas, which are shown in Figure 3: a podium deck (identified as V in Figure 3), a deck along the eastern façade of the building (W), and a deck along the southern façade of the building (X).

FIGURE 3 Proposed Outdoor Use Areas Located on the Third Level



Residential Outdoor Use Area – Fenced Dog Walk (L)

The fenced dog walk would be for private use only and is located in the northeastern corner of Building A. While this outdoor use area would be mostly shielded from Blossom Hill Road, it would have direct line-of-sight to SR 85, with the center of the dog walk set back approximately 205 feet from the centerline of the nearest through lane along southbound SR 85. While the site plan shown in Figure 2 identifies this outdoor use area as being fenced, details regarding the fence were not provided. Assuming worst-case conditions, the fence is not expected to be a sound barrier capable of shielding traffic noise. Under this assumption, the future unattenuated exterior noise levels would be 71 dBA DNL, which would exceed the City's noise threshold by 11 dBA.

Residential Outdoor Use Area – Outdoor Neighborhood Amenity Space (H)

The outdoor neighborhood amenity space would be located along the northwestern façade of Building A, just south of the vehicular entrance to the parking structure. This outdoor use area would be shielded from Blossom Hill Road but would have some direct line-of-sight to SR 85. The center of this space would be set back approximately 330 feet from the centerline of the nearest

through lane along southbound SR 85. The future exterior noise levels would be 65 dBA DNL, which would exceed the City's noise threshold by 5 dBA.

Residential Outdoor Use Area – Affordable Building Amenity Space (C)
The outdoor amenity space at Building B would be located along the western building façade and would have direct line-of-sight to both Blossom Hill Road and SR 85. Intervening buildings would reduce the views of these roadways to 70 degrees or less, which would result in a 4 dBA reduction in noise levels as compared to full view of the roadway (see Figure 2). With the center of the amenity space set back approximately 225 feet from the centerline of Blossom Hill Road, the future exterior noise levels would be 65 dBA DNL, which would exceed the City's noise threshold by 5 dBA.

Residential Outdoor Use Area – Podium Deck (V)
The outdoor podium deck would be located at the center of Building A and would be completely surrounded by the building. Due to the shielding provided by the proposed building, this outdoor use area would have future exterior noise levels below 50 dBA DNL and would be compatible with the City's noise threshold.

Residential Outdoor Use Area – Deck Area Along the Eastern Façade (W)
The third-floor deck along the eastern façade of Building A would have direct line-of-sight to SR 85 and Blossom Hill Road. The center of this deck would be set back approximately be 300 feet from the centerline of the nearest through lane along southbound SR 85 and approximately 195 feet from the centerline of Blossom Hill Road. At these distances and with partial shielding from the project building, the future exterior noise levels would be 72 dBA DNL, which would exceed the City's noise threshold by 12 dBA.

Residential Outdoor Use Area – Deck Area Along the Southern Façade (X)
The third-floor deck along the southern façade of Building A would have direct line-of-sight to Blossom Hill Road, while being mostly shielded from SR 85. The center of this deck would be set back approximately 85 feet from the centerline of Blossom Hill Road. At this distance and with partial shielding from the project building, the future exterior noise levels would be 68 dBA DNL, which would exceed the City's noise threshold by 8 dBA.

Commercial Outdoor Use Area – Retail Plaza (K)
The site plan shows an outdoor retail plaza along the southwestern corner of Building A. While this outdoor use area would be shielded from SR 85, the retail plaza would have direct line-of-sight to Blossom Hill Road, with the center of the space being set back approximately 80 feet from the centerline of roadway. At this distance, the future exterior noise levels would be 72 dBA DNL, which would exceed the City's noise threshold by 2 dBA.

The following outdoor use areas would have future exterior noise levels exceeding the City's residential threshold of 60 dBA DNL: fenced dog walk, outdoor neighborhood amenity space, affordable building amenity space, and both third-floor decks. Additionally, the retail plaza would exceed the City's commercial threshold of 70 dBA DNL. To meet the City's exterior noise thresholds, implementation of measures would be required to reduce noise levels.

Recommended Measures to Reduce Exterior Noise Levels

Methods available to reduce exterior noise levels at outdoor use areas include site planning alternatives (e.g., increased setbacks and using the proposed buildings as noise barriers), the construction of traditional noise barriers, or a combination of the above. Optimal recommendations for each outdoor use area are discussed below.

Residential Outdoor Use Area – Fenced Dog Walk (L)

For the fenced dog walk, relocation of the space would be difficult, as all optimal locations are already reserved as outdoor use areas. Therefore, construction of a noise barrier or specially-designed fence along the perimeter of the dog walk area would be the optimal measure for reducing noise levels.

The barrier would be located around the perimeter of the dog walk, attaching to Building A at both ends. The barrier shall be continuous from grade to top, with no cracks or gaps, and be constructed from materials having a minimum surface density of three lbs/ft^2 (e.g., one-inch nominal thickness wood fence boards, ½-inch laminated glass, masonry clock, or concrete masonry units (CMU)). Table 4 summarizes the exterior noise levels estimated at the center of the dog walk area with varying heights of the perimeter barrier, as modeled in TNM.

As shown in Table 4, to achieve 60 dBA DNL, a barrier height of 14 feet would be required due to the direct line-of-sight to SR 85; however, this area is a relatively small space, and a barrier height of 14 feet would affect the aesthetic appeal of the dog walk, which is intended to be more open. With the implementation of an 8-foot barrier, noise levels would reduce to below 65 dBA DNL. A future exterior noise level of 65 dBA DNL would be well within the range of "conditionally acceptable" noise levels, particularly for multi-family housing proposed near a major roadway and transit station. The 60 dBA DNL "normally acceptable" threshold in the General Plan best fits the expectations of those in suburban areas. Other communities in the Bay Area (e.g., Fremont) allow noise levels up to 65 dBA DNL when the City determines that providing an outdoor DNL of 60 dBA or lower cannot be achieved after the application of appropriate mitigations.

Residential Outdoor Use Area – Outdoor Neighborhood Amenity Space (H)

Relocation of the outdoor neighborhood amenity space at Building A would not improve noise levels, as the proposed building already would provide as much as shielding as possible. With partial shielding from the building and a noise environment of 65 dBA DNL, the City could allow the outdoor use area without implementation of a barrier to further reduce noise levels. Considering this outdoor space is intended to be treated as a neighborhood amenity space, keeping this area open would be ideal.

If, however, the City would require a barrier along the perimeter of this outdoor use area to reduce noise levels to 60 dBA DNL, Table 4 summarizes the exterior noise levels estimated at the center of the outdoor neighborhood amenity space when varying heights of a barrier are implemented. As shown in the table, a 10-foot barrier would be required to meet the City's 60 dBA DNL threshold.

Residential Outdoor Use Area – Affordable Building Amenity Space (C)

Considering Building B would provide partial shielding from both SR 85 and Blossom Hill Road, the location of the affordable building amenity space is optimal for the project site. Therefore, implementation of a perimeter barrier would be required to reduce noise levels. However, with partial shielding from the building and a noise environment of 65 dBA DNL, the City could allow the outdoor use area without implementation of a barrier. Considering this outdoor space is intended to be treated as a neighborhood amenity space, keeping this area open would be ideal.

If, however, the City would require a barrier along the perimeter of this outdoor use area to reduce noise levels to 60 dBA DNL, Table 4 summarizes the exterior noise levels estimated at the center of the affordable building amenity space when varying heights of a barrier are implemented. As shown in the table, a 6-foot barrier would be required to meet the City's 60 dBA DNL threshold.

Residential Outdoor Use Area – Deck Area Along the Eastern Façade (W)

The third-floor deck located along the eastern building façade faces SR 85. This deck could be relocated to the western building façade and receive shielding from Building A; however, the view from the western building façade would not be ideal. Therefore, the optimal measure to reduce exterior noise levels would be to construction a barrier along the perimeter of the deck, attaching to the building at both ends. The barrier shall be continuous from grade to top, with no cracks or gaps, and be constructed from materials having a minimum surface density of three lbs/ft^2. A clear barrier would be optimal in order to maintain aesthetic appeal (e.g., ½-inch laminated glass). Estimated noise levels at the center of the deck when varying barrier heights were implemented are summarized in Table 4.

To achieve 60 dBA DNL, a barrier height of 10 feet would be required due to the direct line-of-sight to SR 85; however, this area is a relatively small space, and a barrier height of 10 feet would affect the aesthetic appeal. With the implementation of an 6-foot barrier, noise levels would reduce to below 65 dBA DNL, which is within the range of "conditionally acceptable" noise levels. As discussed above, the City could accept this option on a conditional basis, considering the unreasonable requirements for achieving 60 dBA DNL.

Residential Outdoor Use Area – Deck Area Along the Southern Façade (X)

Relocating the third-floor deck located on the southern façade of Building A to the western façade could be an option; however, the view for occupants would be more restrictive. Assuming relocating this third-floor deck would not be feasible, the optimal measure would be to construct a barrier. Similar to the deck located on the eastern building façade, a clear barrier would be preferred in order to maintain aesthetic appeal (e.g., ½-inch laminated glass). Estimated noise levels at the center of the deck when varying barrier heights were implemented are summarized in Table 4.

A 6-foot barrier would reduce noise levels at this south-facing deck to below 60 dBA DNL.

TABLE 4 Summary of Future Exterior Noise Levels at Outdoor Use Areas with Varying Barrier Heights

Outdoor Use Area	Estimated Exterior Noise Levels at Center of Outdoor Use Area, dBA DNL					
	No Barrier	6-foot Barrier	8-foot Barrier	10-foot Barrier	12-foot Barrier	14-foot Barrier
Dog Walk (L)	71	66	64	63	61	60
Outdoor Neighborhood Amenity Space (H)	65	62	61	60	--	--
Affordable Building Amenity Space (C)	65	59	--	--	--	--
Deck Area Along the Eastern Façade (W)	72	64	61	59	--	--
Deck Area Along the Southern Façade (X)	68	59	--	--	--	--

Commercial Outdoor Use Area – Retail Plaza (K)

The site plan shows outdoor dining areas associated with the commercial uses along the southern and eastern sides of Building A. If the outdoor dining area was limited to the eastern side of Building A only, with a minimum setback of 100 feet, the project buildings would provide enough shielding to reduce exterior noise levels to at or below 70 dBA DNL. Considering the outdoor nature of the dining areas, constructing a barrier around the perimeter would impede on the sidewalk and affect the aesthetic appeal of the dining area. Further, the unattenuated noise levels along the southern side of Building A would fall within the conditionally acceptable threshold range established by the City of San José.

Exterior Noise Level Summary

With the implementation of an 8-foot barrier at the dog walk area and a 6-foot barrier at the third-floor deck on the eastern façade of Building A, a conditionally acceptable exterior noise threshold of 65 dBA DNL would be achieved at the center of each outdoor use space. To achieve this conditionally acceptable exterior noise threshold, no barrier would be required at the ground-level amenity spaces at Buildings A and B. To achieve the normally acceptable threshold, a 6-foot barrier would be required at the affordable building amenity space; a 10-foot barrier would be required at the outdoor neighborhood amenity space and at the third-floor deck located on the eastern façade of Building A; and a 14-foot barrier would be required at the dog walk.

With the implementation of a 6-foot barrier at the third-floor deck located along the southern building façade of Building A, the City's normally acceptable threshold of 60 dBA DNL for residential uses would be achieved at the center of outdoor use area.

Since the unattenuated exterior noise levels at the commercial retail plaza would exceed the normally acceptable threshold by only 2 dBA and therefore would fall within the conditionally acceptable range, no barrier would be recommended. To meet the normally acceptable threshold, limiting outdoor dining to the eastern side of Building A would be the optimal design alternative.

The final recommendations shall be confirmed when detailed site plans and grading plans are available.

Conditions of Approval

Prior to the issuance of any building permit, the project applicant shall ensure all outdoor use areas achieve future exterior noise levels at or below the City's "normally acceptable" threshold of 60 dBA DNL at the center of the spaces where reasonably achievable. For common outdoor use areas where 60 dBA DNL is not reasonably achievable, measures should be incorporated to achieve reasonable "conditionally acceptable" noise levels at the centers of the outdoor use spaces.

The project applicant shall retain a qualified acoustical consultant to review the final site plan in order to determine specific noise reduction measures to meet the City's requirements. Noise reduction measures could include increased setbacks, using the proposed building façades as noise barriers, the construction of traditional noise barriers, or a combination of these methods. The applicant's retained qualified acoustical consultant shall prepare a detailed acoustical study during final building design to evaluate the land use compatibility of the proposed common use outdoor spaces with the future noise environment at the site and to identify the necessary noise controls that are included in the design to meet the City's requirements. The study shall be submitted to the Director of Planning, Building and Code Enforcement or the Director's designee prior to issuance of any building permit.

Future Interior Noise Environment

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.

<u>Southern Building Façade of Buildings A and B</u>
The residential units located along the southern building façades of both buildings would be set back approximately 75 to 85 feet from the centerline of Blossom Hill Road. These units would be mostly shielded from SR 85. The exterior-facing units along this façade would be exposed to future exterior noise levels ranging from 72 to 73 dBA DNL on floors 2 through 6. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 57 to 58 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

Eastern and Northeastern Building Façades of Building A

The residential units located along the eastern and northeastern building façades of Building A would be set back approximately 160 to 370 feet from the centerline of the nearest through lane along southbound SR 85. These units closest to SR 85 would be shielded from Blossom Hill Road, while the units farther from SR 85 would be exposed to traffic noise from both roadways. The exterior-facing units along these façades, which would be located on floors 3 through 6, would be exposed to future exterior noise levels ranging from 72 to 77 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 57 to 62 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

Western Building Façade of Building B

The residential units located along the western building façade of Building B would be set back approximately 75 to 345 feet from the centerline of the Blossom Hill Road and would be partially shielded from SR 85. The exterior-facing units along this façade, which would be located on floors 1 through 5, would be exposed to future exterior noise levels ranging from 65 to 72 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 50 to 57 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

Northern Building Façade of Building B

The residential units located along the northern building façade of Building B would be set back approximately 345 to 390 feet from the centerline of the nearest through lane of southbound SR 85. The exterior-facing units along this façade, which would be located on floors 1 through 5, would be exposed to future exterior noise levels ranging from 65 to 68 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 50 to 53 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

Units Facing Entrance Driveway of Buildings A and B

Units located along the western façade of Building A and the eastern façade of Building B, which would be facing the entrance driveway of the project site, would be partially shielded from both Blossom Hill Road and SR 85; however, due to the orientation of Building A, the units along the northwest façade would have more direct exposure to SR 85. With setbacks from the centerline of Blossom Hill Road ranging from 85 to 270 feet at Building A, the units along the western building façade would be exposed to future exterior noise levels ranging from 65 to 70 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 50 to 55 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

With setbacks ranging from 155 to 375 feet from the centerline of the nearest through lane along southbound SR 85, the units along the northwest façade of Building A would be exposed to future exterior noise levels ranging from 65 to 76 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 50 to 61 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

With setbacks from the centerline of Blossom Hill Road ranging from 75 to 345 feet at Building B, these units would be exposed to future exterior noise levels ranging from 66 to 71 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would range from 51 to 56 dBA DNL, which would exceed the City's 45 dBA DNL interior noise threshold.

Units of Building A Surrounding the Podium Deck

Units surrounding the podium deck at Building A would be shielded from traffic noise along both Blossom Hill Road and SR 85. These units would be exposed to future exterior noise levels at or below 60 dBA DNL. Assuming windows to be partially open for ventilation, the future interior noise levels would be at or below 45 dBA DNL, which would meet the City's 45 dBA DNL interior noise threshold.

Table 5 summarizes the future noise levels at the exterior façades, as well as within the residential interiors along each building façade, assuming windows to be partially open for ventilation. Under this assumption, the future interior noise levels for the proposed project would exceed the City's interior noise threshold of 45 dBA DNL within residential units along the building exterior. Noise insulation features would be required to reduce interior noise levels to at or below 45 dBA DNL.

TABLE 5 Summary of Future Exterior and Interior Noise Levels Along Each Building Façade

Building Façade	Future Exterior Noise Levels, DNL (dBA)	Future Interior Noise Levels, DNL (dBA)	Minimum STC Ratings
Southern Façade of Buildings A and B	72 to 73	57 to 58	32 STC
Northeastern and Eastern Façades of Building A	72 to 77	57 to 62	31 to 43 STC
Western Façade of Building B	65 to 72	50 to 57	28 to 32 STC
Northern Façade of Building B	65 to 68	50 to 53	28 STC
Eastern Façade of Building B and Western Façade of Building A	65 to 71	50 to 56	28 to 32 STC
Northwestern Façade of Building A	65 to 76	50 to 61	28 to 43 STC
Interior Units Surrounding Podium Deck of Building A	At or Below 60	At or Below 45	Standard Construction

Ground-Level Commercial Uses

The commercial uses will be located on the ground-level of Buildings A and B, along the southern façades of both buildings and also along the western façade of Building A. The minimum setback of the southern building façades would be 75 to 85 feet from the centerline of Blossom Hill Road. Based on the 2018 measurements along Blossom Hill Road (LT-2), the projected hourly average noise levels during daytime hours of operation would range from 63 to 72 dBA L_{eq} at the nearest building façade by the year 2035, and the day-night average noise level would range from 72 to 73 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 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 $L_{eq(1\text{-}hr)}$.

Spaces where lower noise levels would be desired, such as the learning center/library located in Building B, may benefit from additional noise control in order to meet a lower, more desirable interior noise level. Additional noise control could be accomplished by selecting higher sound-rated windows (STC 34 to STC 38 along exterior façades).

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 façades of Buildings A and B shall require windows and doors with the minimum STC ratings summarized in Table 5, as well as the incorporation of adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

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

Conditions of Approval

A qualified acoustical specialist shall prepare a detailed analysis of interior residential noise levels resulting from all exterior sources during the design phase pursuant to requirements set forth in the City's General Plan and State Building Code. The study will also establish appropriate criteria for noise levels inside the commercial spaces affected by environmental noise. The study will review the final site plan, building elevations, and floor plans prior to construction and recommend building treatments to reduce residential interior noise levels to 45 dBA DNL or lower and to reduce commercial interior noise levels to 50 dBA $L_{eq(1\text{-}hr)}$ or lower. Treatments would include, but are not limited to, sound-rated windows and doors, sound-rated wall and window constructions, acoustical caulking, protected ventilation openings, etc. The specific determination of what noise insulation treatments are necessary shall be conducted on a unit-by-unit basis during final design of the project. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City, along with the building plans and approved design, prior to issuance of a building permit.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

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

- A significant noise impact would be identified if the project would generate a substantial temporary or permanent noise level increase over ambient noise levels at existing noise-sensitive receptors surrounding the project site and that would exceed applicable noise standards presented in the General Plan or Municipal Code at existing noise-sensitive receptors surrounding the project site.

    - A significant noise impact would be identified if construction-related noise would temporarily increase ambient noise levels at sensitive receptors. The City of San José considers large or complex projects involving substantial noise-generating activities and lasting more than 12 months significant when within 500 feet of residential land uses or within 200 feet of commercial land uses or offices.

    - A significant permanent noise level increase would occur if project-generated traffic would result in: a) a noise level increase of 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) a noise level increase of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater.

    - A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan.

- A significant impact would be identified if the construction of the project would generate excessive vibration levels surrounding receptors. Groundborne vibration levels exceeding 0.2 in/sec PPV would have the potential to result in cosmetic damage to normal buildings.

- A significant noise impact would be identified if the project would expose people residing or working in the project area to excessive aircraft 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 for a period exceeding one year. **This is a significant impact.**

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 to use best available noise suppression devices and techniques and to 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 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, use of impact equipment, or building framing) continuing for more than 12 months.

Project construction will occur from 7:00 a.m. to 7:00 p.m. Monday through Saturday. While no construction is expected to occur during nighttime hours, a permit from the City would be required to operate outside the allowable hours since the project site is located within 500 feet of residences and within 200 feet of commercial or office uses.

Existing residences to the east and southeast are located along SR 85 and would be exposed to ambient noise levels ranging from 72 to 77 dBA L_{eq} during daytime hours. The medical center and residences south of the project site, as well as residences and commercial uses west of the project site, would have ambient noise levels dominated by Blossom Hill Road, which would range from 63 to 72 dBA L_{eq} during daytime hours.

The typical range of maximum instantaneous noise levels for the proposed project, based on the equipment list provided, would be 70 to 90 dBA L_{max} at a distance of 50 feet (see Table 6). Table 7 shows the hourly average noise level ranges, by construction phase for various types of construction projects. Hourly average noise levels generated by construction are about 65 to 88 dBA L_{eq} for residential 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 8 summarizes the equipment expected to be used during each phase of construction and the duration for each phase for the proposed buildings. For each phase, the equipment shown in Table 8 was used as inputs into the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) to predict the combined average noise level per phase. To model worst-case conditions, it was assumed that all equipment per phase would be operating simultaneously. For construction noise, the use of multiple pieces of equipment simultaneously would add together as a collective noise source. While every piece of equipment per phase would likely be scattered throughout the site, the noise-sensitive receptors surrounding the site would be subject to the collective noise source generated by all equipment operating at once. Therefore, to assess construction noise impacts at the receiving property lines of noise-sensitive receptors, the collective worst-case hourly average noise level for each phase was centered at the geometrical center of the site and propagated to the nearest property line of the surrounding land uses. These noise level estimates are also shown in Table 8. These levels do not assume reductions due to intervening buildings or existing barriers.

Additionally, a trail extension is planned along the western portion of the project site, and a trail head will be constructed at the northwestern corner of the site. Details pertaining to the trail

extension, including construction equipment and scheduling, were not available at the time of this study. However, activities such as grading and excavation, paving, and landscaping would be expected as part of the construction of the trail extension and trail head. Using the noise levels summarized in Table 5 at 50 feet from the center of a busy construction site, noise levels at the property lines of the residences west of the project site, which would be 75 feet from the center of the walking trail and 100 feet from the center of the trail head, would range from 78 to 85 dBA L_{eq}, assuming no shielding. During construction of a walking trail extension, however, the construction work would move along the trail, potentially impacting any individual receptor for a limited number of days. Further, the trail head is located along SR 85, which would dominate the noise environment and mask most construction noise occurring at the trail head and along the trail extension.

As shown in Table 8, ambient levels at the surrounding uses would potentially be exceeded by 5 dBA L_{eq} or more at various times throughout construction. Project construction is expected to last for a period of about two years. Since project construction is expected to exceed one year in duration and is located within 500 feet of existing residential dwellings, the project would be considered a significant impact. The trail extension and trail head construction would be considered a less-than-significant impact due to the short duration of exposure for any individual receptor and the existing noise environment dominated by SR 85.

TABLE 6 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

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
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 7 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

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

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

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

TABLE 8 Estimated Construction Noise Levels at Nearby Land Uses

Phase of Construction	Time Duration	Construction Equipment (Quantity)	Calculated Hourly Average Noise Levels, L_{eq} (dBA)			
			Northeast Res. (630ft)	Southeast Res. (550ft)	South Res. & Medical Center (335t)	West Res. & Comm. (325t)
Demolition	15 days	Grader (2) Excavator (2) Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1)	65 dBA	66 dBA	71 dBA	71 dBA
Site Preparation	10 days	Grader (1) Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1)	63 dBA	64 dBA	68 dBA	68 dBA
Grading/Excavation	40 days	Excavator (1) Grader (1) Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1) Roller (2) Broom Sweeper (1) Material Handling Equip. (2)	64 dBA	65 dBA	70 dBA	70 dBA
Trenching/ Foundation	40 days	Tractor/Loader/Backhoe (2) Excavator (1) Front End Loader (1) Broom Sweeper (1) Material Handling Equip. (2)	63 dBA	64 dBA	69 dBA	69 dBA
Building Exterior	541 days	Crane (1) Forklift (2) Generator Set (1) Welder (1) Concrete Truck (8) Material Handling Equip. (4) Air Compressor (2) Aerial Lift (2)	65 dBA	66 dBA	70 dBA	70 dBA
Building Interior/Architectural Coating	541 days	Air Compressor (6)	60-66 dBA[a]	61-67 dBA[a]	65-71 dBA[a]	65-71 dBA[a]
Paving	60 days	Paver (1)	66 dBA	68 dBA	72 dBA	72 dBA

Phase of Construction	Time Duration	Construction Equipment (Quantity)	Calculated Hourly Average Noise Levels, L_{eq} (dBA)			
			Northeast Res. (630ft)	Southeast Res. (550ft)	South Res. & Medical Center (335t)	West Res. & Comm. (325t)
		Paving Equipment (1) Roller (1) Tractor/Loader/Backhoe (1) Concrete Truck (2) Asphalt Delivery Truck (5) Material Handling Equip. (5) Landscape Trencher (1)				

[a] Range of hourly average noise levels reflects the Building Interior/Architectural Coating phase only and in combination with the Building Exterior phase.

Mitigation Measure 1a:

Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction material, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life. The Municipal Code requires that reasonable noise reduction measures be incorporated into the construction plan and implemented during all phases of construction activity. In accordance with Policy EC-1.7, a construction noise logistics plan should be developed for the proposed project.

The potential short-term noise impacts associated with construction of the project would be mitigated by the implementation of General Plan Policy EC-1.7. This policy states:

> Construction operations within the City will be required to use available noise suppression devices and techniques and continue to 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.

Construction Noise Logistics Plan: Prior to the issuance of any grading or demolition permits, the project proponent shall submit and implement a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting and notification of construction schedules, equipment to be used, and designation of a noise disturbance coordinator. The noise disturbance coordinator shall respond to neighborhood complaints and shall be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses. The noise logistic plan shall be submitted to the Director of Planning or Director's designee of the Department of Planning, Building and Code Enforcement prior to the issuance of any grading or demolition permits.

As a part of the noise logistic plan and project, construction activities for the proposed project shall include, but is not limited to, the following best management practices:

- In accordance with Policy EC-1.7 of the City's General Plan, utilize the best available noise suppression devices and techniques during construction activities.

- Construction will be limited 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. No construction activities are permitted on the weekends at sites within 500 feet of a residence (San José Municipal Code Section 20.100.450). 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.

- The contractor shall use "new technology" power construction equipment with state-of-the-art noise shielding and muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poorly maintained engines or other components.

- The unnecessary idling of internal combustion engines shall be prohibited.

- Staging areas and stationary noise-generating equipment shall be located as far as possible from noise-sensitive receptors, such as residential uses (a minimum of 200 feet).

- The surrounding neighborhood shall be notified early and frequently of the construction activities.

- A "noise disturbance coordinator" shall be designated to respond to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., beginning work too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator would be conspicuously posted at the construction site.

A "construction noise logistics plan," in accordance with Policy EC-1.7, would further reduce construction noise levels emanating from the site. Typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists.

- Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment.

- Construct temporary noise barriers, where feasible, to screen stationary noise-generating equipment when located within 200 feet of adjoining sensitive land uses. Temporary noise barrier fences would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receptor and if the barrier is constructed in a manner that eliminates any cracks or gaps.

- If stationary noise-generating equipment must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used. Any enclosure openings or venting shall face away from sensitive receptors.

- Ensure that generators, compressors, and pumps are housed in acoustical enclosures.

- Locate cranes as far from adjoining noise-sensitive receptors as possible.

- During final grading, substitute graders for bulldozers, where feasible. Wheeled heavy equipment are quieter than track equipment and should be used where feasible.

- Substitute nail guns for manual hammering, where feasible.

- Substitute electrically-powered tools for noisier pneumatic tools, where feasible.

- The Construction Noise Logistic Plan, inclusive of the above shall be signed by a qualified acoustical specialist verifying that the implementation measures included in this Plan meets the reduction to noise levels as required by this mitigation measure.

With the implementation of GP Policy EC-1.7, Municipal Code requirements, and the above measures, the temporary construction noise impact would be reduced to a **less-than-significant** level.

Impact 1b: **Permanent Noise Level Increase.** The proposed project is not expected to cause a substantial permanent noise level increase at the existing residential land uses in the project vicinity. **This is a less-than-significant impact.**

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if the project would increase noise levels at noise-sensitive receptors by 3 dBA DNL or more where ambient noise levels exceed the "normally acceptable" noise level standard. Where ambient noise levels are at or below the "normally acceptable" noise level standard, noise level increases of 5 dBA DNL or more would be considered significant. The City's General Plan defines the "normally acceptable" outdoor noise level standard for the residential land uses to be 60 dBA DNL. Based on the 2035 noise contour plot included in the City's General Plan, future ambient levels along Blossom Hill Road would exceed 60 dBA DNL. Therefore, a significant impact for noise-sensitive receptors in the project vicinity would occur if traffic due to the proposed project would permanently increase ambient levels by 3 dBA DNL. For reference, a 3 dBA DNL noise increase would be expected if the project would double existing traffic volumes along a roadway.

The traffic study prepared for the proposed project included peak hour turning movements for six intersections in the project vicinity. By adding the project trips to the existing peak hour volumes, the existing plus project traffic volumes were estimated. By comparing the existing plus project peak hour traffic volumes to the existing volumes along each segment included in the traffic study, the noise level increase was calculated to be less than 1 dBA. The project would not result in doubling of the traffic, and therefore, the proposed project would not result in a significant permanent noise increase. This is a less-than-significant impact.

The trail extension would not result in a measurable noise level increase due to traffic. The peak hour trips generated by the walking trail extension would be significantly fewer than the residential development, which were 102 during the peak AM hour and 139 during the peak PM hour. Assuming worst-case conditions, however, the peak hour trips included in the traffic report were doubled to account for the trail extension. When added to the existing traffic volumes along the surrounding roadways, the proposed project plus the train extension resulted in a noise level increase of less than 1 dBA. Therefore, with fewer peak hour trips, the trail extension and trail head addition would not make a measurable increase to the noise environment. This would be a less-than-significant impact.

Mitigation Measure 1b: None required.

Impact 1c: Noise Levels in Excess of Standards. The proposed project would not generate noise in excess of standards established in the City's General Plan at the nearby sensitive receptors. The project is not expected to generate noise levels in excess of the City's Municipal Code thresholds either. **This is a less-than-significant impact.**

The City's General Plan does not include policies specifically addressing mechanical noise generated by residential land uses. However, the residential mechanical noise should be addressed with respect to the City's Municipal Code threshold of 55 dBA DNL to minimize disturbance to the existing residences surrounding the project site. Policies EC-1.3 and EC-1.6, which limit noise generated by commercial uses to 55 dBA DNL at nearby residential uses, shall be enforced for the proposed project.

Mechanical Equipment

The proposed project would include mechanical equipment, such as heating, ventilation, and air conditioning systems (HVAC). The site plan shows small electrical and mechanical rooms on the first and second floors of Building A and electrical and mechanical rooms on the first floor of Building B. It is expected that the HVAC units would be located on the roofs of both buildings; however, the roof plans available at the time of this study did not include details regarding mechanical equipment placement or quantities. Additionally, information regarding size of units, capacity, and noise levels generated were not available at the time of this study.

The commercial uses associated with this project are relatively small, located along the southern façades of the buildings facing Blossom Hill Road, and would not include significant additional noise-generating equipment. Any exterior mechanical equipment noise generated at the project site would be located on the rooftops of Buildings A and B for both residential and commercial uses.

Noise levels produced by a typical heat pump for buildings this size are approximately 56 dBA at 3 feet during operation. Noise levels produced by a typical air conditioning condenser are approximately 66 dBA at 3 feet during operation. These types of units typically cycle on and off continuously during daytime and nighttime hours. Therefore, multiple units clustered in the same general vicinity are usually operating simultaneously at any given time. Assuming up to eight

heating pumps and condenser units would operate simultaneously, the combined noise level would be 74 dBA at 3 feet. If this hourly average noise level were to operate each hour in a 24-hour period, which would represent worst-case conditions, the day-night average noise level for rooftop equipment at a distance of 3 feet would be 81 dBA DNL. It is assumed that the nearest equipment would be set back 10 feet from the edge of the rooftops of each building; therefore, the property line of the nearest surrounding land use (commercial building west of the site) would be 120 feet from the rooftop equipment of Building B. At this distance, the hourly average noise levels would be 42 dBA L_{eq}, and the day-night average noise level would be 49 dBA DNL. Table 9 summarizes the mechanical equipment noise estimated at each of the surrounding land uses.

TABLE 9 Estimated Operational Noise Levels for Eight Heating Pumps and Eight Air Conditioning Condensers Operating Simultaneously

Receptor	Distance from Noise Source	Hourly Average Noise Level	Day-Night Average Noise Level
Western Commercial Property Plane	120 feet	42 dBA L_{eq}	48 dBA DNL
Western Residential Property Plane	150 to 170 feet	39 to 40 dBA L_{eq}	46 to 47 dBA DNL
Southern Residential & Medical Property Planes	145 feet	41 dBA L_{eq}	47 dBA DNL
Southeastern Residential Property Plane	270 feet	35 dBA L_{eq}	42 dBA DNL
Southwestern Medical Property Plane	185 feet	38 dBA L_{eq}	45 dBA DNL
Northeastern Residential Property Plane	470 feet	30 dBA L_{eq}	37 dBA DNL

As summarized in Table 9, noise levels due to mechanical equipment noise would be below the City's requirements of 55 dBA DNL at the residential property lines. Additionally, the City's Municipal Code thresholds for residential and commercial uses would also be met. This would be a less-than-significant impact.

All commercial, residential, and medical buildings located on the surrounding properties would be an additional 15 feet or more from the property lines, which would further reduce the noise levels by up to 1 dBA at the nearest façade. Considering the high noise environment at the project site and the surrounding area, mechanical equipment noise would not result in a permanent noise increase at the noise-sensitive receptors. Further, this analysis assumed no shielding from the proposed building or any mechanical screening that may be proposed. This would further reduce estimated noise levels in Table 9.

Truck Deliveries

The site plan shows a loading area and trash room at the northernmost part of Building A, facing SR 85. Two additional loading zones and drop-off/pick-up areas are shown along the western façade of Building and the eastern façade of Building B along the entrance driveway. It is assumed that these loading areas would be used for all proposed commercial uses. Due to the orientation of

Building A, the loading zone located at the northernmost corner of Building A would be shielded from residences to the south by the proposed building. The distance from this loading zone to the nearest residential property line east of SR 85 would be approximately 470 feet and to the nearest residential property line to the west would be approximately 400 feet. The loading zones along the main entrance driveway would be shielded from residences to the east of SR 85 and to the west, but residences and medical buildings located south of Blossom Hill Road would have some direct line-of-sight to these areas. The nearest loading zone would be approximately 235 feet from the nearest residential and medical building property line to the south.

Based on the size of the commercial uses proposed for this project, it is expected that smaller, medium-sized delivery trucks would be used at the site. These trucks typically generate maximum noise levels of 60 to 65 dBA L_{max} at a distance of 50 feet. Low speed truck noise results from 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. The noise levels produced by backup alarms can vary depending on the type and directivity of the sound, but maximum noise levels are typically between 65 to 75 dBA L_{max} at a distance of 50 feet. Typically, 1 medium truck deliveries would occur in an hour. The equivalent hourly average noise level at 50 feet would be 61 dBA L_{eq} with 1 medium truck delivery in an hour. Assuming up to 2 deliveries in a single day occurring during daytime hours only, the day-night average noise level at 50 feet would be 50 dBA DNL. When propagated to the nearest residential property line to the east of SR 85 (i.e., at 470 feet), the hourly average noise level would be 42 dBA L_{eq}, and the day-night average noise level would be 31 dBA DNL. When propagated to the nearest residential property line to the west of the project site (i.e., at 400 feet), the hourly average noise level would be 43 dBA L_{eq}, and the day-night average noise level would be 32 dBA DNL. When propagated to the nearest residential property line to the south of Blossom Hill Road (i.e., at 235 feet), the hourly average noise level would be 48 dBA L_{eq}, and the day-night average noise level would be 37 dBA DNL.

Assuming all deliveries and on-site maintenance activities would occur during daytime hours between 7:00 a.m. and 10:00 p.m., a noise increase above existing conditions is not expected. Further, these trucks would access the project site from Blossom Hill Road, which currently includes truck traffic. Truck deliveries occurring at the proposed project site are not expected to generate levels exceeding 55 dBA DNL or existing ambient conditions at the nearby noise-sensitive land uses. This would be a less-than-significant impact.

Daily Operational Noise Due to the Walking Trail Extension

The proposed walking trail along the western part of the project site would include activities such as bicycling, walking, and jogging. Noise levels generated by activity on the trail would be minimal. Typical noise levels generated by people talking or laughing would range from 50 to 55 dBA at 20 feet. The loudest noise sources would include warning whistles or bells from bicycles or a person shouting, which would typically range from 65 to 70 dBA at 20 feet. However, noise sources along walking trails would be in constant motion, passing a single residential property in less than 1 minute. Typical hourly average noise levels for trails is less than 45 dBA L_{eq} at 20 feet. Assuming the maximum usage each hour during daytime hours between 7:00 a.m. and 9:00 p.m., the day-night average noise level at 20 feet would be 43 dBA DNL.

While the trail extension and trail head construction may increase outdoor activity in the vicinity of existing residences, these types of activities would be spread out throughout the day, which would not be expected to measurably increase the hourly average noise level or day-night average noise level. Further, the existing noise environment is dominated by vehicular traffic noise sources (SR 85 and Blossom Hill Road), which would mask any noise generated at the walking trail. Considering the existing noise environment, increased outdoor activity on the proposed walking trail would not measurably increase noise levels at existing noise-sensitive receptors in the project vicinity.

Mitigation Measure 1c: None required.

Impact 2: Exposure to Excessive Groundborne Vibration due to Construction. Construction-related vibration levels resulting from activities are not expected to exceed 0.2 in/sec PPV at the surrounding sensitive land uses. **This is a less-than-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. While pile driving equipment can cause excessive vibration, it is not expected to be required for the proposed project.

According to Policy EC-2.3 of the City of San José General Plan, 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.

Table 10 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 10 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.

TABLE 10 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	58	26
Hydromill (slurry wall)	in soil	0.008	3	1
	in rock	0.017	6	2
Vibratory Roller		0.210	60	27
Hoe Ram		0.089	28	12
Large bulldozer		0.089	28	12
Caisson drilling		0.089	28	12
Loaded trucks		0.076	24	10
Jackhammer		0.035	12	5
Small bulldozer		0.003	1	<1

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006, as modified by Illingworth & Rodkin, Inc., October 2020.

Based on the Historical Resources Inventory for the City of San José,[6] the nearest historically documented building, which would be the Cottle Ranch at 5285 Snell Avenue, is over 4,000 feet northeast of the project site. This property would be exposed to construction vibration levels at or below 0.001 in/sec PPV. Construction equipment would not generate vibration levels in excess of the City's 0.08 in/sec PPV vibration threshold.

Table 11 summarizes the vibration levels at the nearest adjacent buildings surrounding the site. While construction noise sources increase based the number of pieces of equipment operating simultaneously, construction vibration would be dependent on the location of individual pieces of equipment. That is, equipment scattered throughout the site would not generate a collective vibration source 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 11), 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 Tables 10 and 11 was operating along the nearest boundary of the project site, which would represent the worst-case scenario.

Due to the roadways and creek located along the perimeter of the project site, the nearest surrounding buildings would be 70 feet or more from the nearest edge of the walking trail, which would result in vibration levels at or below 0.068 in/sec PPV. Heavy construction equipment for the proposed project would be even farther from the surrounding commercial and residential structures. Therefore, vibration levels generated by construction equipment at the project site and at the walking trail extension would be at or below 0.068 in/sec PPV at all buildings surrounding the site.

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

The City's threshold of 0.2 in/sec PPV for non-historical buildings would not be exceeded at the any buildings surrounding the site during project construction activities. This would be a less-than-significant impact.

At areas surrounding areas within 200 feet, vibration levels would potentially be perceptible. 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.

TABLE 11 Vibration Source Levels for Construction Equipment

Equipment		PPV (in/sec)			
		Northeast Res. (390ft)	Southeast Res. (265ft)	South Res. & Medical Center (145ft)	West Res. & Comm. (85ft)
Clam shovel drop		0.010	0.015	0.029	0.053
Hydromill (slurry wall)	in soil	0.0004	0.001	0.001	0.002
	in rock	0.001	0.001	0.002	0.004
Vibratory Roller		0.010	0.016	0.030	0.055
Hoe Ram		0.004	0.007	0.013	0.023
Large bulldozer		0.004	0.007	0.013	0.023
Caisson drilling		0.004	0.007	0.013	0.023
Loaded trucks		0.004	0.006	0.011	0.020
Jackhammer		0.002	0.003	0.005	0.009
Small bulldozer		0.0001	0.0002	0.0004	0.001

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006, as modified by Illingworth & Rodkin, Inc., October 2020.

Mitigation Measure 2: None required.

Impact 3: Excessive Aircraft Noise. The project site is located approximately 5 miles from Norman Y. Mineta San José International. The proposed project would not expose people residing or working at the site to excessive aircraft noise. **This is a less-than-significant impact.**

Norman Y. Mineta San José International Airport is a public-use airport located approximately 8 miles northwest of the project site. According to the City's new Airport Master Plan Environmental Impact Report,[7] the project site lies well outside the 60 dBA CNEL/DNL contour line (see Figure 4). 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.

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

Assuming standard construction materials for aircraft noise below 60 dBA DNL, 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: **None required.**

FIGURE 4 2027 CNEL Noise Contours for SJIA Relative to Project Site

Figure 5
Scenario 2: With Project 2037 Noise Contour Map

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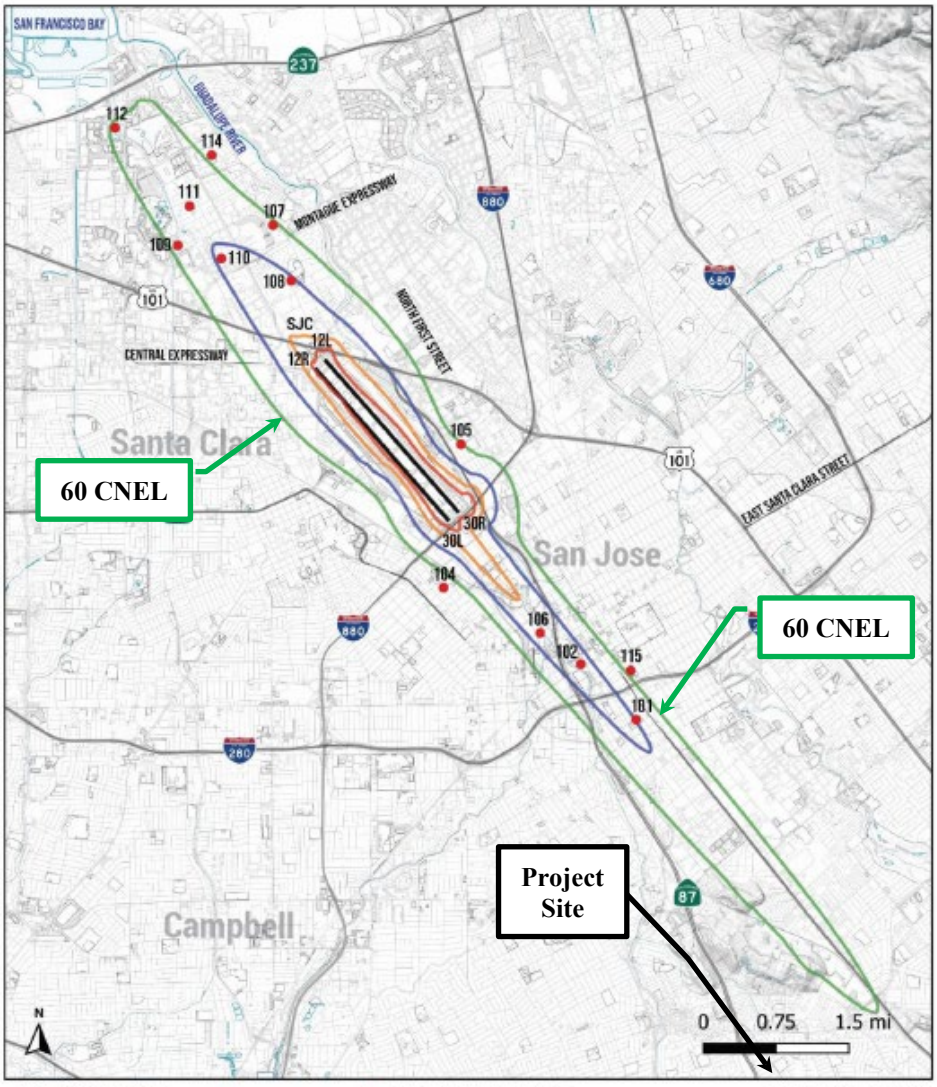


NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

- 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

FIGURE A1 Daily Trend in Noise Levels at LT-1, Sunday October 19, 2003 through Tuesday October 21, 2003

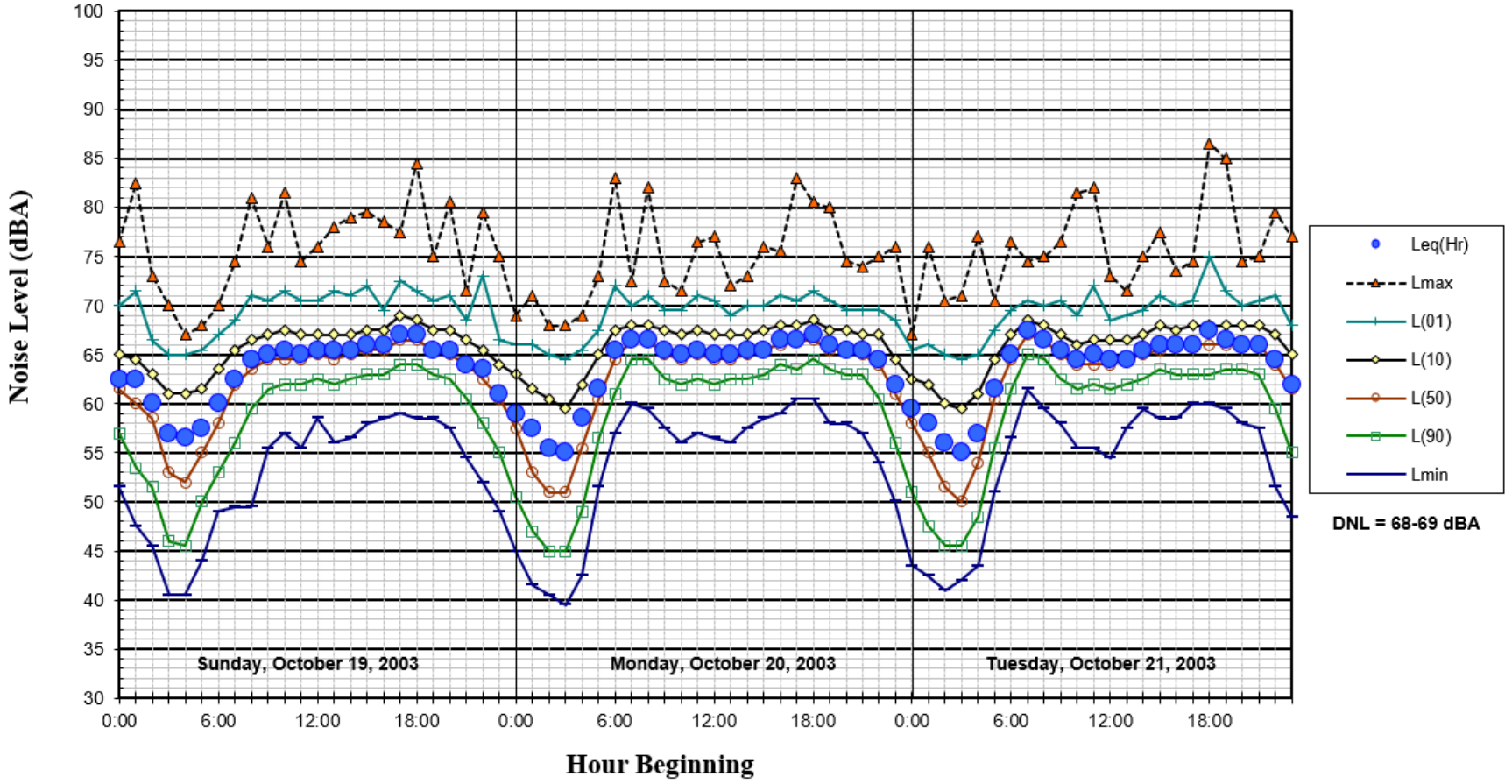


FIGURE A2 Daily Trend in Noise Levels at LT-2, Saturday October 6, 2018

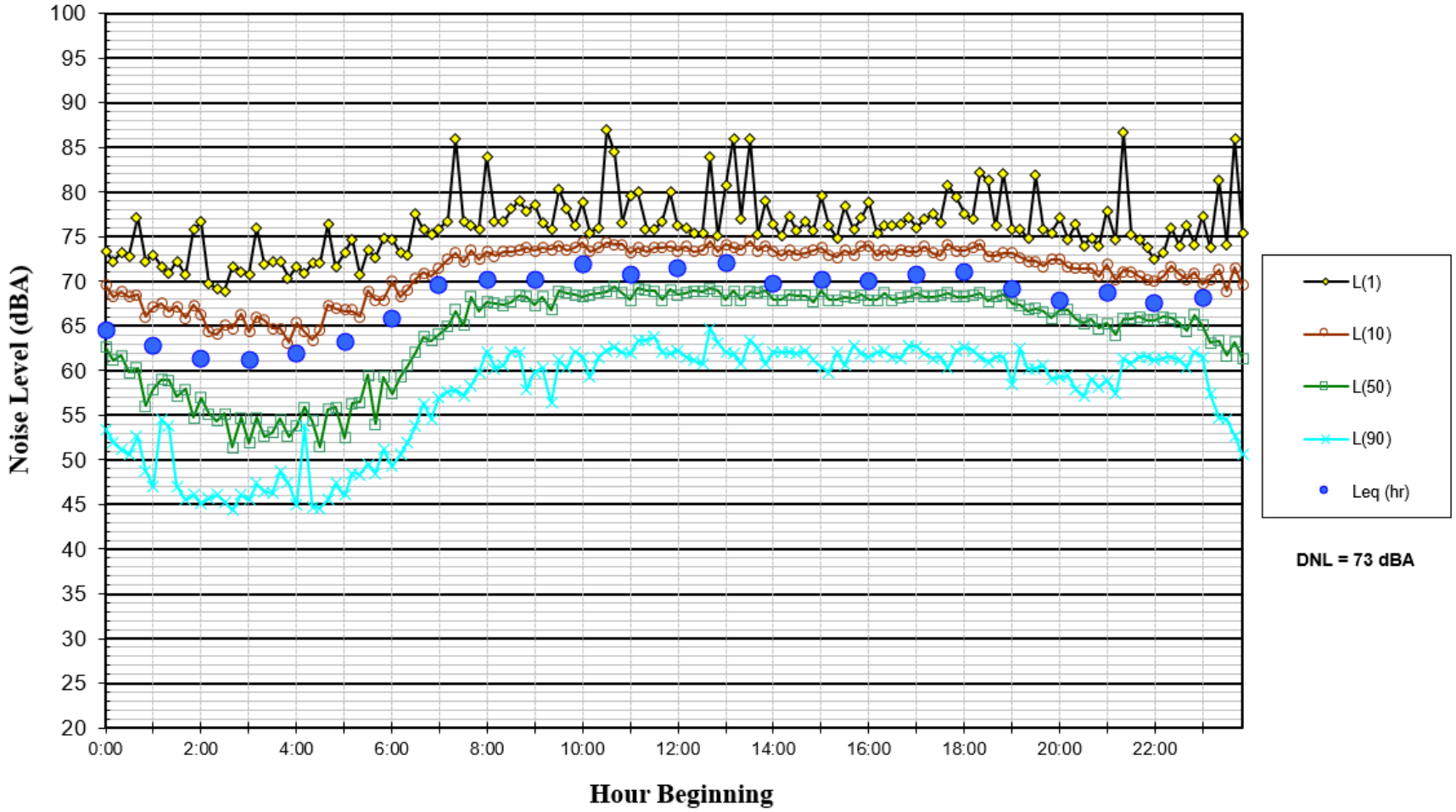


FIGURE A3 Daily Trend in Noise Levels at LT-2, Sunday October 7, 2018

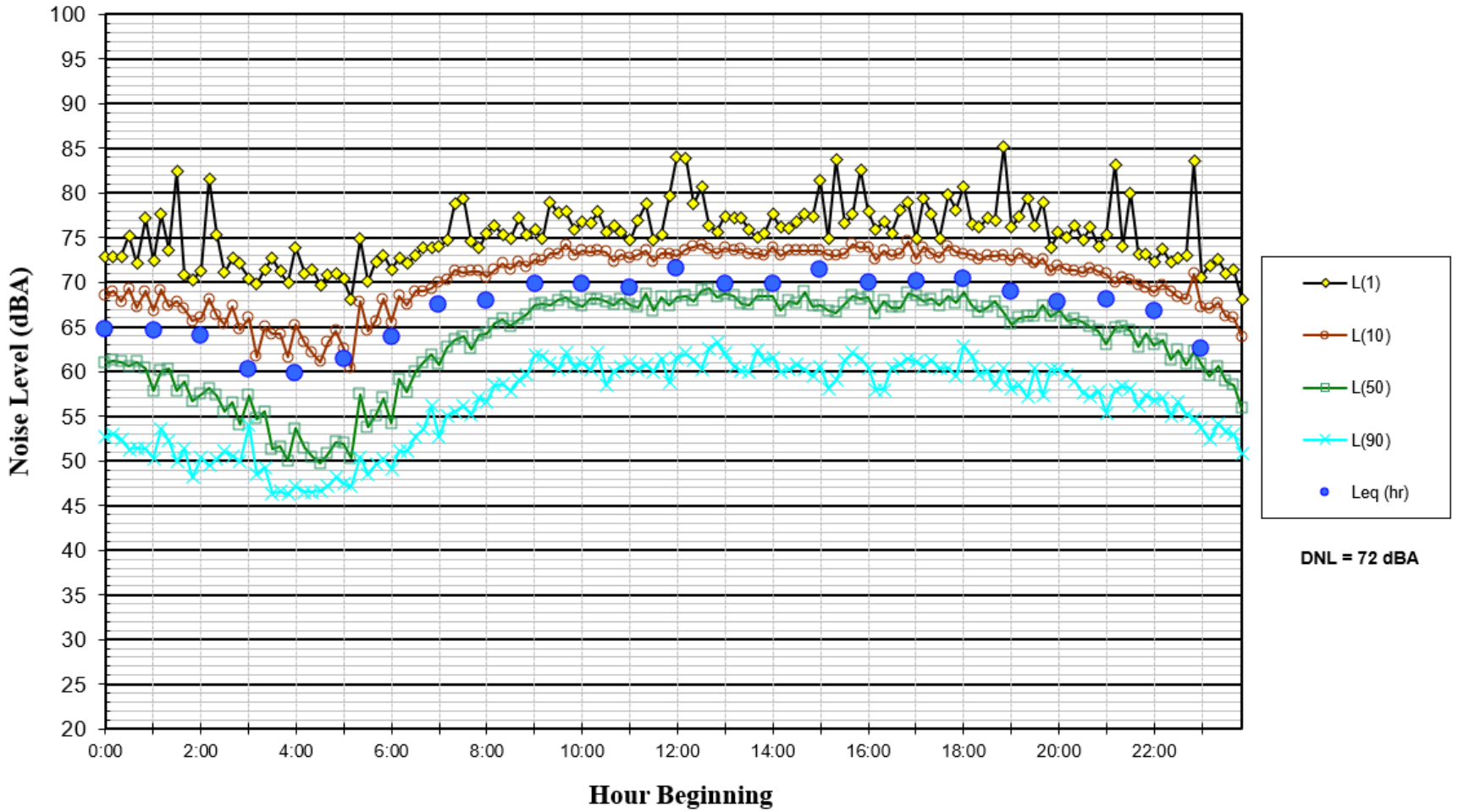


FIGURE A4 Daily Trend in Noise Levels at LT-2, Monday October 8, 2018

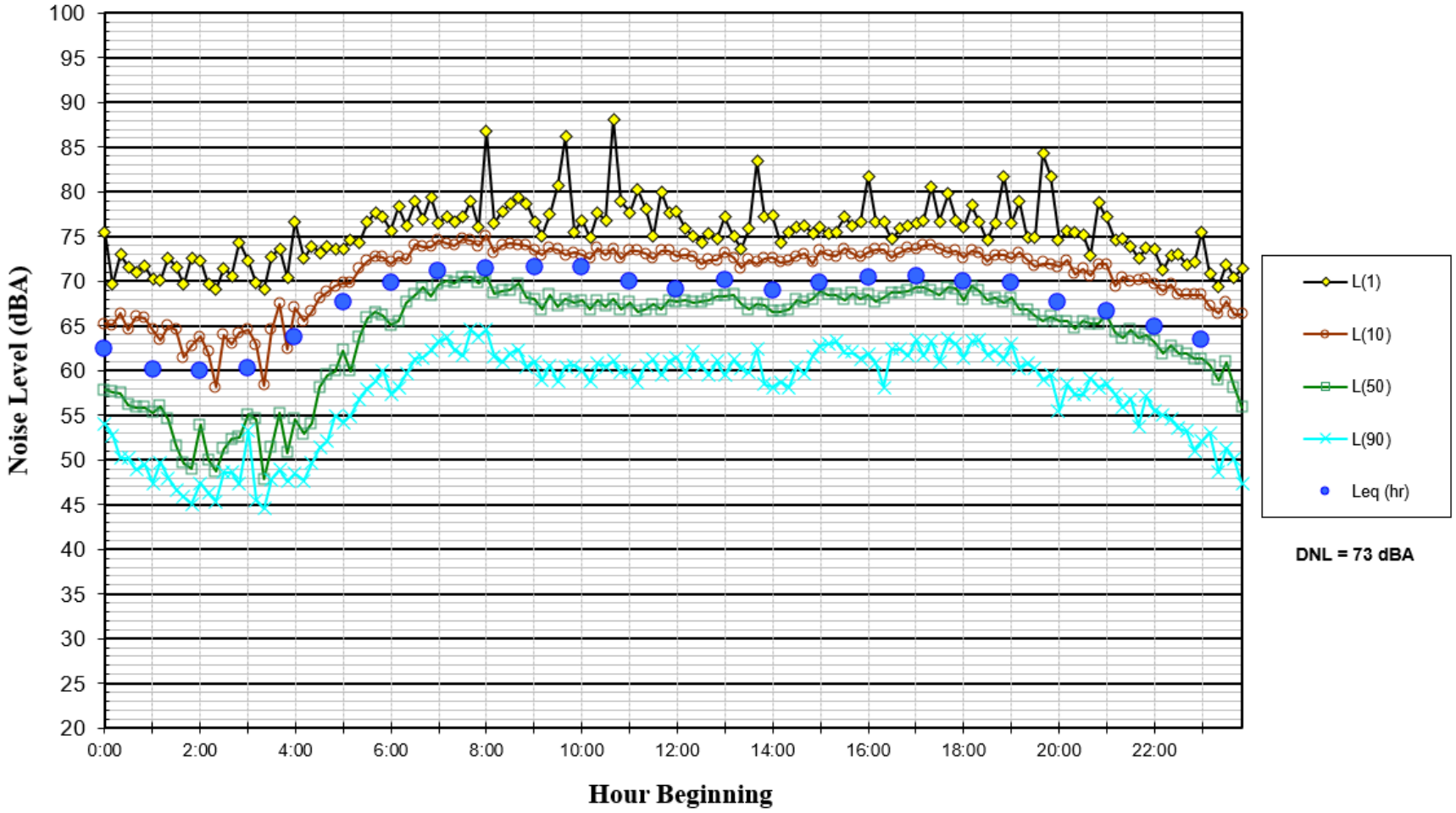
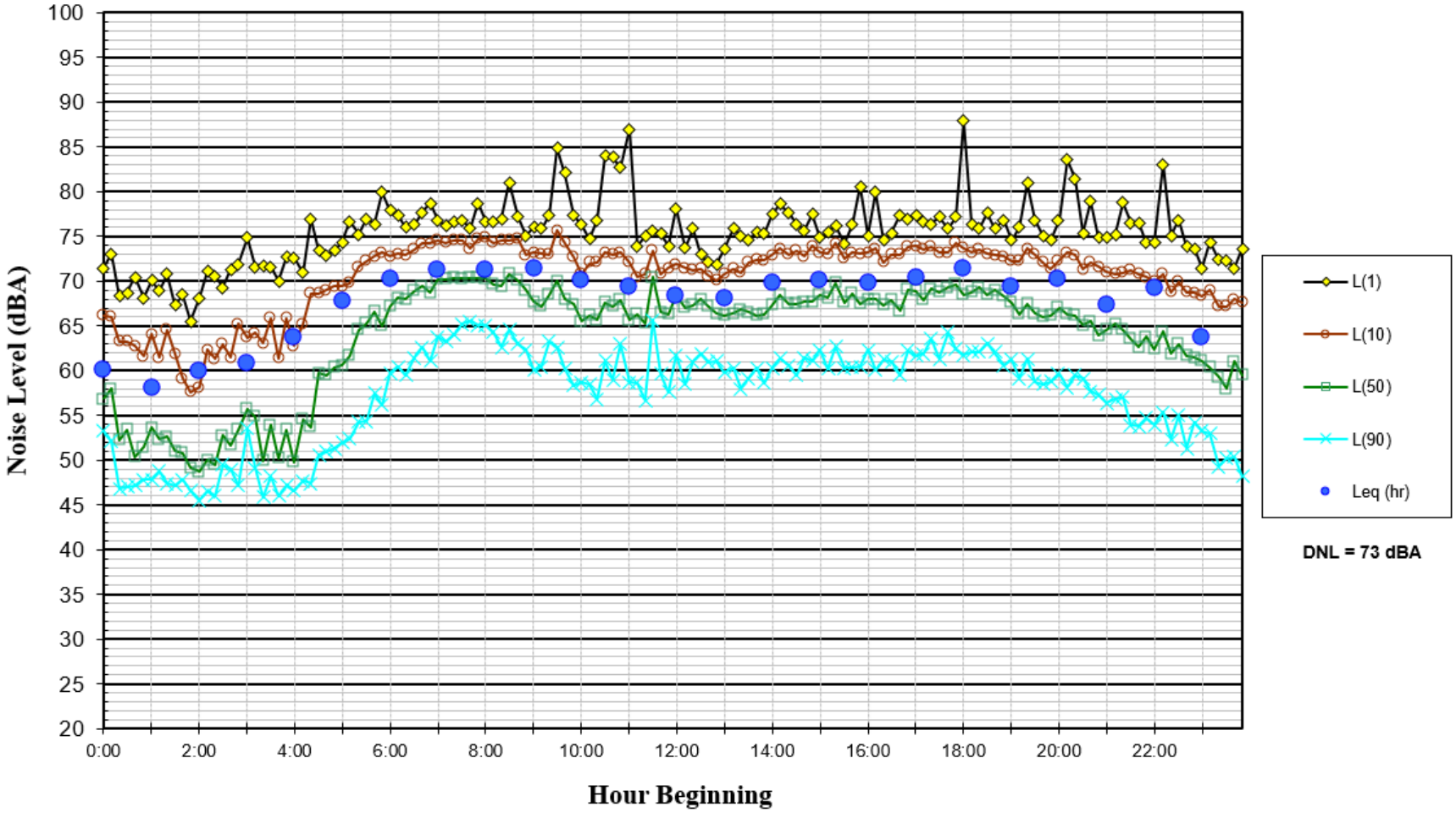


FIGURE A5 Daily Trend in Noise Levels at LT-2, Tuesday October 9, 2018



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Via email: cneer@davidjpowers.com

Subject: **Blossom Hill Station TOD Trail Improvements, San José, CA – Addendum to the Noise and Vibration Assessment**

Dear Ms. Neer:

In November 2020, *Illingworth & Rodkin, Inc*. (I&R) prepared a noise and vibration assessment reflecting the worst-case scenario for the Blossom Hill Station TOD project[1] in San José, California. In August 2021, the applicant reduced the total square footage of commercial space in the mixed-use building, and I&R updated the assessment state that the worst-case scenario previously studied would satisfy the scenario with reduced commercial space. The project also included a program-level assessment of the proposed trail improvements. However, since the completion of the study, more details regarding the trail have become available, requiring a full project-level noise and vibration assessment of the trail improvements.

This addendum letter discusses the potential impacts generated by the trail improvements at existing land uses in the project vicinity.

Proposed Trail Improvements

The proposed project would include the construction of an approximately 0.6-mile trail that would be about a 10- to 12-foot-wide paved asphalt concrete pedestrian/bicycle trail located between Blossom Hill Road and Martial Cottle Park and running along the Canoas Creek. Additionally, two trailhead plazas would be constructed on-site to mark the entrance of the trail at Blossom Hill Road and another in the northwest corner of the project site, marking the direction to the Blossom Hill light rail station. The trail improvements would pass through land owned by Santa Clara Valley Transportation Authority (VTA), California Department of Transportation (Caltrans), and the County of Santa Clara. The proposed trail segment south of State Route 85 (SR 85) would be

[1] Illingworth & Rodkin, Inc., "Blossom Hill Station TOD Noise and Vibration Assessment," November 17, 2020.

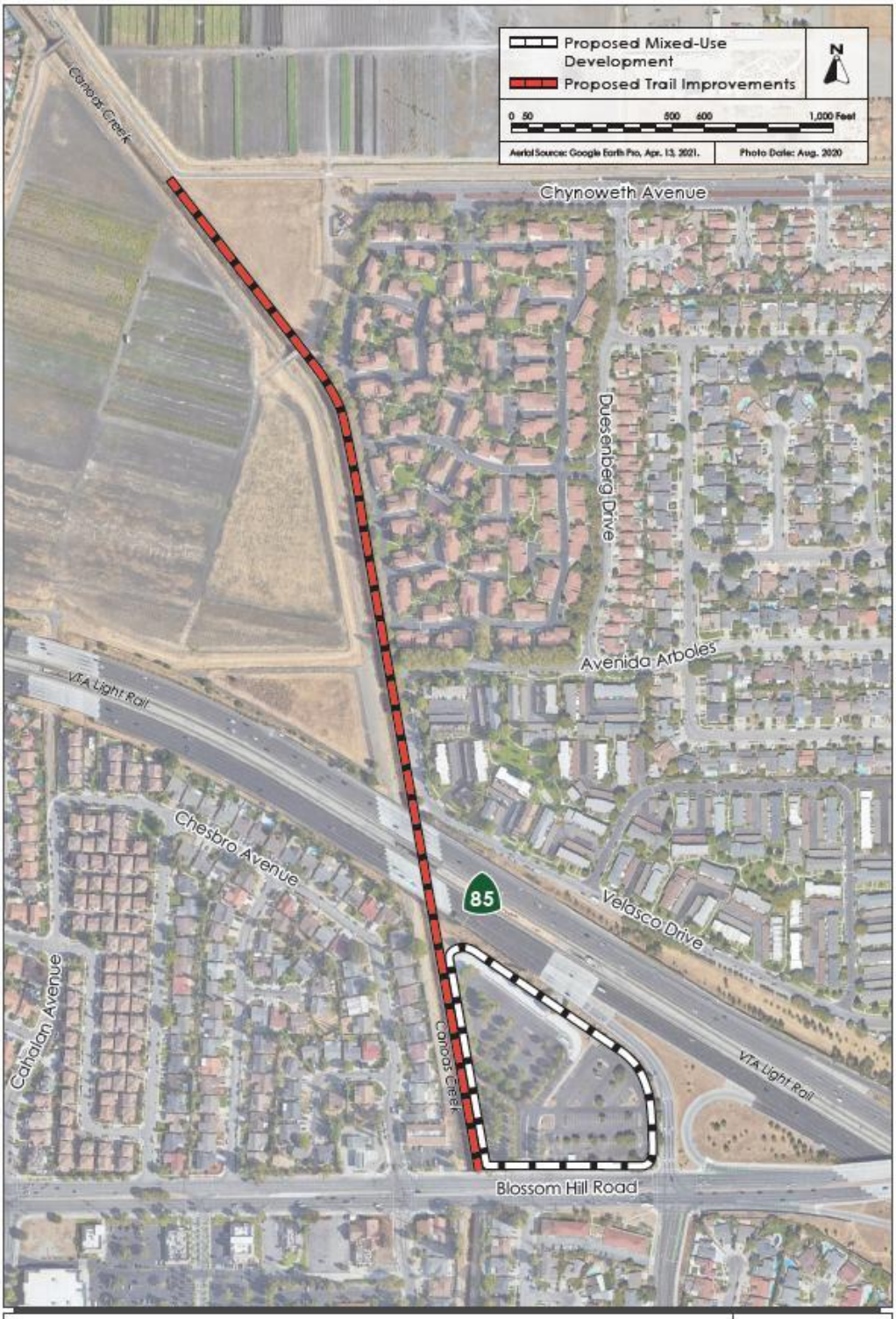
coordinated with VTA, the segment that runs under SR 85 would be coordinated with Caltrans, and the segment north of SR 85 would be coordinated with the County of Santa Clara. The proposed trail would also require collaboration with the City of San José Parks, Recreation & Neighborhood Services Department and Valley Water, as the improvements would be maintained by the City and located within the riparian setback.

Lighting would be provided along the trail adjacent to and underneath SR 85 for user safety. Signage, landscaping, and/or fencing would buffer the trail from the adjacent residential neighborhoods to the west and east of Canoas Creek. The trail would cross an existing gravel path used by farmers at Martial Cottle Park to transport farm equipment between agricultural fields. Signage would be provided along the proposed trail alignment before and after this crossing warning trail users of potential farm equipment crossing.

Construction of the trail improvements would include demolition of a portion of the freestanding wall and fence under SR 85, cheek wall and staircase at the Blossom Hill light rail station and construction of a new staircase and landing separate from the trail. No construction work is proposed within Canoas Creek, however, due to the location of the trail improvements on land owned by other agencies, permitting and approval for this project component would be required from Caltrans, Valley Water, and the County of Santa Clara.

Figure 1 shows the alignment of the proposed trail improvements project with respect to the proposed mixed-use development.

FIGURE 1 Proposed Blossom Hill Station TOD Trail Alignment



Construction Noise

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 to use best available noise suppression devices and techniques and to 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 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, use of impact equipment, or building framing) continuing for more than 12 months.

The existing noise environment for all surrounding residences, north and south of SR 85, would be dominated by traffic noise along the highway. According to the ambient noise measurements made for the proposed project, daytime ambient noise levels would range from 72 to 77 dBA L_{eq}.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The highest maximum noise levels generated by project construction would typically range from about 80 to 90 dBA L_{max} at a distance of 50 feet from the noise source, and typical hourly average noise levels for recreational land uses would range from 71 to 89 dBA L_{eq}, as measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). A list of typical maximum instantaneous noise levels and hourly average noise level ranges were provided in the November 2020 noise assessment.

Construction activities for the proposed trail improvements would include excavation and paving of the trail, as well as construction of two trailhead plazas and associated utilities work. A detailed list of equipment expected to be used for the proposed trail improvements and phasing information was summarized in Table 1. Table 1 also provides the estimated hourly average noise levels expected at the property lines of the nearest noise-sensitive land uses surrounding the site. The equipment expected for each phase of construction were assumed to be operating simultaneously for the construction noise level calculations, which represents a credible worst-case scenario at nearby receptors. Construction noise levels were estimated from the center of the trail to nearest property line of the surrounding receptors. 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 can provide an additional 5 to 10 dBA noise reduction at distant receptors.

For construction of the trail, no one receptor would be exposed to construction over the entire duration of the project due to the length of the trail corridor and the fact that construction activities would advance along the corridor as construction proceeds. This would further reduce the

cumulative amount of time that individual receptors would be exposed to elevated construction noise levels.

TABLE 1 Estimated Construction Noise Levels at Nearby Land Uses

Phase	Time Duration	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} from Center of Trail to Nearest Land Use Property Line, dBA	
			Residences South of SR 85 (60ft)	Residences North of SR 85 (40 to 290ft)
Demolition	1/3/2022-1/7/2022	Concrete/Industrial Saw (1) Excavator (1) Rubber-Tired Loader (1)	83	69 to 86
Site Preparation	1/10/2022-1/14/2022	Grader (1) Tractor/Loader/Backhoe (1) Rubber-Tired Loader (1)	83	69 to 86
Grading/ Excavation	1/17/2022-1/28/2022	Grader (1) Tractor/Loader/Backhoe (1) Rubber-Tired Loader (1)	83	69 to 86
Trenching/ Foundations/ Utilities	1/31/2022-2/11/2022	Tractor/Loader/Backhoe (1) Excavator (1)	80	66 to 84
Paving	2/14/2022-2/18/2022	Cement and Mortar Mixer (1) Paver (1) Roller (2) Tractor/Loader/Backhoe (1)	81	68 to 85

Estimated construction noise levels summarized in Table1 are expected to occur between 7:00 a.m. and 5:00 p.m., which fall within the City's allowable construction hours. These construction noise levels would exceed ambient levels by more than 5 dBA L_{eq} at times; however, total construction of the trail improvements would take less than two months. Since construction is not expected to exceed one year in duration, construction of the trail improvements would be considered a less-than-significant impact, according to the City of San José.

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City to use best available noise suppression devices and techniques and to 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. The following best management practices shall be incorporated into the project, in adherence to Policy EC-1.7:

- Construction will be limited 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.

- The contractor shall use "new technology" power construction equipment with state-of-the-art noise shielding and muffling devices. All internal combustion engines used on the

project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poorly maintained engines or other components.

- The unnecessary idling of internal combustion engines shall be prohibited. Staging areas and stationary noise-generating equipment shall be located as far as possible from noise-sensitive receptors such as residential uses (a minimum of 200 feet, where feasible).

- The surrounding neighborhood within 500 feet shall be notified early and frequently of the construction activities.

- A "noise disturbance coordinator" shall be designated to respond to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., beginning work too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator would be conspicuously posted at the construction site.

With the implementation of GP Policy EC-1.7, Municipal Code requirements, and the above best management practices and considering construction of the trail improvements would last for less than two months, the temporary construction noise impact would be considered less-than-significant.

Construction Vibration Assessment

The construction of the trail improvements may generate vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include grading, foundation work, and paving. According to the list of construction equipment provided for this project, pile driving, which can cause excessive vibration, would not be required for the proposed project construction. Critical factors pertaining to the impact of construction vibration on sensitive receptors include the proximity of the existing structures to the project site, the soundness of the structures, and the methods of construction used.

According to Policy EC-2.3 of the City of San José General Plan, 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.

Table 2 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. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 2 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.

TABLE 2 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	58	26
Hydromill (slurry wall)	in soil	0.008	3	1
	in rock	0.017	6	2
Vibratory Roller		0.210	60	27
Hoe Ram		0.089	28	12
Large bulldozer		0.089	28	12
Caisson drilling		0.089	28	12
Loaded trucks		0.076	24	10
Jackhammer		0.035	12	5
Small bulldozer		0.003	1	<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., June 2021.

Based on the Historical Resources Inventory for the City of San José,[2] the nearest historically documented building, which would be the Cottle Ranch at 5285 Snell Avenue, is over 4,000 feet northeast of the project site. This property would be exposed to construction vibration levels at or below 0.001 in/sec PPV. Construction equipment would not generate vibration levels in excess of the City's 0.08 in/sec PPV vibration threshold.

While construction noise sources increase based the number of pieces of equipment operating simultaneously, construction vibration would be dependent on the location of individual pieces of equipment. That is, equipment scattered throughout the trail improvements corridor would not generate a collective vibration source level, but a vibratory roller, for instance, operating near the edge of the trail 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 are different than the distances used to propagate construction noise levels (as shown in Table 1). Table 3 summarizes construction vibration levels at the nearest residential buildings along the trail improvements corridor, assuming each piece of equipment would be operating along the edge of the trail.

The nearest surrounding residential and commercial buildings would be 35 feet or more from the nearest edge of the walking trail, which would result in vibration levels at or below 0.145 in/sec PPV. The City's threshold of 0.2 in/sec PPV for non-historical buildings would not be exceeded at the any buildings surrounding the site during construction activities for the trail improvements. This would be a less-than-significant impact.

At surrounding areas within 200 feet, vibration levels would potentially be perceptible. By use of administrative controls, such as notifying neighbors of scheduled construction activities and

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

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.

TABLE 3 Vibration Source Levels for Construction Equipment

Equipment		PPV (in/sec)		
		Residences South of SR 85 (70ft)	Convenient Store South of SR 85 (60ft)	Residences North of SR 85 (35ft)
Clam shovel drop		0.065	0.077	0.140
Hydromill (slurry wall)	in soil	0.003	0.003	0.006
	in rock	0.005	0.006	0.012
Vibratory Roller		0.068	0.080	0.145
Hoe Ram		0.029	0.034	0.061
Large bulldozer		0.029	0.034	0.061
Caisson drilling		0.029	0.034	0.061
Loaded trucks		0.024	0.029	0.052
Jackhammer		0.011	0.013	0.024
Small bulldozer		0.001	0.001	0.002

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., June 2021.

Operational Noise

Under the City's Noise Element, noise generated by new nonresidential land uses shall not exceed a noise level of 55 dBA DNL at receiving residential uses.

Activities expected along the proposed trail would include bicycling, walking, and jogging. These types of activities are not considered noise-generating sources subject to noise control standards. These activities would be considered part of ambient noise environments, such as those in and surrounding residential developments. Further, noise generated along SR 85 would mask any noise generated along the trail. Operational noise due to the trail would not exceed 55 dBA DNL at the surrounding residential property lines and would not exceed existing ambient noise levels. This would be a less-than-significant impact.

Permanent Noise Increase

At the surrounding land uses, a significant impact would occur if traffic due to the proposed project would permanently increase ambient levels by 3 dBA DNL. Due to the nature of the proposed trail improvements, project trips would be negligible for this type of project. Therefore, the permanent traffic noise increase due to the trail improvements would be virtually zero. This is a less-than-significant impact.

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Please feel free to contact us with any questions on the analysis or if we can be of further assistance.

Sincerely,

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Illingworth & Rodkin, Inc.

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