BELLARMINE COLLEGE PREPARATORY MASTER PLAN UPDATE NOISE ASSESSMENT

San José, California

December 6, 2022

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INTRODUCTION

The 17.64-acre project site is located at 960 W. Hedding Street in the City of San José. The project site is currently developed with a private high school and residential uses for faculty and religious staff. The proposed Master Plan update project includes revisions to the current PD Zoning District to allow for the following renovations and replacement of existing aging educational facilities:

- Relocate Berchman's Hall (a CEQA historic resource) from the southeast to the southwest corner of the Elm Street/W. Hedding Street intersection;
- Demolish Wade Hall and construct a new 44,000-square-foot two-story academic building in its place;
- Construct a new east-west entry driveway parallel to W. Hedding Street and extending from Matthewson Hall to the Robotics Building;
- Renovate the interior of the existing Liccardo Center building;
- Demolish the O'Donnell Building and construct a new 23,000-square-foot two-story academic building in its place; and
- Renovate the interior of Matthewson Hall.

It is our understanding that the project would not increase the maximum student population currently allowed on-site or increase the vehicular ingress/egress locations.

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

SETTING

Fundamentals of Environmental Noise

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

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

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

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

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

Effects of Noise

Sleep and Speech Interference

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

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The DNL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA DNL. At a DNL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the DNL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a DNL of 60 to 70 dBA. Between a DNL of 70 to 80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the DNL is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

TABLE 1 Definition of Acoustical Terms Used in this Report

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

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

TABLE 2 Typical Noise Levels in the Environment

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

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

Fundamentals of Groundborne Vibration

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

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

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

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

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

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

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

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

Regulatory Background – Noise

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

Federal Government

Federal Transit Administration. The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[1] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses and to 90 dBA L_{eq} at commercial and industrial land uses. These construction noise thresholds are a recommendation, not a requirement.

State of California

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

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

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

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

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Santa Clara County

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

4.3.2.1 Noise Compatibility Policies

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

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

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

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

Table 4 - 1

NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

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

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

City of San José

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

EC-1.2 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-1.7 Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

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

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

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

Regulatory Background – Vibration

City of San José

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

EC-2.3 Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or buildings 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

Bellarmine College Preparatory High School is located one-half mile east of the intersection of Interstate 880 (I-880) and The Alameda in San José, California. The noise environment consists of a mixture of transportation noise including local, collector/distributer, background arterial and interstate traffic, aircraft, and railroad trains, as well as student activity noise. W. Hedding Street runs through the campus neighborhood, along with many local roads in the residential neighborhood bordering the campus to the west, south, and east. The Norman Y. Mineta San Jose International Airport is located approximately one-half mile to the north, and the Union Pacific Railroad (UPRR) tracks run along the northeast side of the campus.

A noise monitoring survey was performed to quantify and characterize noise levels at the site and in the project vicinity between Wednesday, November 2, 2022 and Friday, November 4, 2022. The monitoring survey included four long-term noise measurements (LT-1 through LT-4) and four short-term noise measurements (ST-1 through ST-4). Figure 1 shows the project site, vicinity, and noise measurement locations.

FIGURE 1 Noise Measurement Locations

Source: Google Earth 2022

Long-term noise measurement LT-1 was made approximately 145 feet northwest of the centerline of W. Hedding Street. This location was chosen to quantify noise levels at the nearest noise-sensitive residential receptors northwest of Berchman's Hall, the W. Hedding Street parking lot, and Wade Hall. Noise levels measured at this location were primarily the result of traffic along W. Hedding Street, aircraft, and daily operations associated with the school's facilities and parking lots. Weekday hourly average noise levels ranged from 58 to 66 dBA L_{eq} during the day and from 50 to 63 dBA L_{eq} at night. The day-night average noise level on Thursday, November 3, 2022 was 65 dBA DNL. The daily trends in noise levels at LT-1 are shown in Appendix A.

Long-term noise measurement LT-2 was made approximately 40 feet northwest of the centerline of W. Hedding Street. This location was chosen to quantify average noise levels at the nearest noise-sensitive residential receptors northwest of Matthewson Hall, the future site of the relocated Berchman's Hall, and the associated parking lot. Noise levels measured at this location were primarily the result of traffic along W. Hedding Street, aircraft, and daily operations associated with the school's facilities and parking lots. Weekday hourly average noise levels at this location ranged from 63 to 70 dBA L_{eq} during the day and from 55 to 67 dBA L_{eq} at night. The day-night average noise level on Thursday, November 3, 2022 was 69 dBA DNL. The daily trends in noise levels at LT-2 are shown in Appendix A.

Long-term noise measurement LT-3 was made approximately 30 feet southeast of the centerline of University Avenue. This location was chosen to quantify average noise levels at the nearest noise-sensitive residential receptors adjacent to O'Donnell Hall. Noise levels measured at this location were primarily the result of traffic along University Avenue, aircraft, and daily operations associated with student activities. Weekday hourly average noise levels at this location ranged from 53 to 61 dBA L_{eq} during the day and from 46 to 59 dBA L_{eq} at night. The day-night average noise level on Thursday, November 3, 2022 was 61 dBA DNL. The daily trends in noise levels at LT-3 are shown in Appendix A.

Long-term noise measurement LT-4 was made approximately 22 feet northeast of the centerline of Laurel Street. This location was chosen to quantify average noise levels at the nearby noise-sensitive residential receptors in the proximity of the future site of the parking garage. The parking structure was already under construction at the time of the noise survey, and noise measurements were not conducted at the nearest noise-sensitive residential receptors adjacent to the parking area because the noise data would be affected by construction noise. Noise levels measured at LT-4 were primarily the result of traffic along Laurel Street, aircraft, railroad trains, construction, and San Jose Fire Department Station 7. Weekday hourly average noise levels at this location ranged from 53 to 68 dBA L_{eq} during the day and from 45 to 59 dBA L_{eq} at night. The day-night average noise level on Thursday, November 3, 2022 was 62 dBA DNL. The daily trends in noise levels at LT-4 are shown in Appendix A.

Short-term noise measurement ST-1 was made on Wednesday, November 2, 2022 over a ten-minute period starting at 12:20 p.m. and concluding at 12:30 p.m. ST-1 was made half-way down Emory Street, between Laurel Street and Elm Street. This location was selected, in conjunction with LT-4, to further quantify ambient noise levels in the residential neighborhood to the southeast of the campus. The 10-minute average noise level measured at this location was 52 dBA L_{eq}. Four passing vehicles produced maximum noise levels ranging from 60 to 65 dBA L_{max}. Aircraft produced maximum noise levels ranging from 50 to 58 dBA L_{max}. A single Amtrack train produced maximum noise levels up to 53 dBA L_{max}, and nearby student activities produced maximum noise levels ranging from 45 to 55 dBA L_{max}.

Short-term noise measurement ST-2 was made on Wednesday, November 2, 2022 over a ten-minute period starting at 12:40 p.m. and concluding at 12:50 p.m. ST-2 was made near the intersection of University Avenue and Elm Street. This location was selected, in conjunction with LT-3, to further quantify ambient noise levels in the residential neighborhood to the south of the campus. The 10-minute average noise level measured at this location was 58 dBA L_{eq}. One vehicle pass-by produced maximum noise levels up to 64 dBA L_{max}, while distant background traffic noise levels ranged from 55 to 58 dBA L_{max}. Aircraft produced maximum noise levels ranging from 58 to 67 dBA L_{max}. A single school bell produced maximum noise levels up to 62 dBA L_{max}, and nearby student activities produced maximum noise levels ranging from 50 to 58 dBA L_{max}.

Short-term noise measurement ST-3 was made on Wednesday, November 2, 2022 over a ten-minute period starting at 1:00 p.m. and concluding at 1:10 p.m. ST-3 was made in the southwest corner of the Matthewson Hall parking lot. This location was selected, in conjunction with LT-2, to quantify ambient noise levels at the nearest noise-sensitive residential receptors adjacent to Matthewson Hall and the associated parking lot. The 10-minute average noise level measured at this location was 53 dBA L_{eq}. Sixty-nine vehicles on W. Hedding Street produced maximum noise levels ranging from 49 to 56 dBA L_{max}. Aircraft produced maximum noise levels ranging from 55 to 62 dBA L_{max}.

Short-term noise measurement ST-4 was made on Wednesday, November 2, 2022 over a ten-minute period starting at 1:20 p.m. and concluding at 1:30 p.m. ST-4 was made along Elm Street between McKendrie Street and W. Hedding Street. This location was selected, in conjunction with LT-1, to further quantify ambient noise levels in the residential neighborhood to the west of the campus. The 10-minute average noise level measured at this location was 56 dBA L_{eq}. Four passing vehicles produced maximum noise levels ranging from 60 to 73 dBA L_{max}, while distant background traffic noise levels ranged from 52 to 55 dBA L_{max}. Aircraft produced maximum noise levels ranging from 56 to 58 dBA L_{max}. A distant train horn produced maximum noise levels up to 57 dBA L_{max}. Table 4 summarizes the results of short-term measurement ST-1 through ST-4.

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

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: Emory Street, in-between Laurel Street and Elm Street (11/2/2022, 12:20 p.m. - 12:30 p.m.)	66	63	54	49	47	52
ST-2: Intersection of University Avenue and Elm Street (11/2/2022, 12:40 p.m. - 12:50 p.m.)	67	64	60	57	55	58
ST-3: Southwest corner of the Matthewson Hall parking lot (11/2/2022, 1:00 p.m. - 1:10 p.m.)	64	60	55	52	48	53
ST-4: Elm Street, between McKendrie Street and W. Hedding Street (11/2/2022, 1:20 p.m. - 1:30 p.m.)	73	66	56	54	53	56

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques and through appropriate land use policies in the City of San José. The project site is currently, and would continue to be, used for educational purposes. The future noise environment at the site would continue to result from a combination of vehicular traffic along W. Hedding Street and local streets, background I-880 traffic, UPRR trains, student activities, and aircraft associated with the Norman Y. Mineta San José International Airport, and would continue to be compatible with the proposed educational land uses.

Operational Noise

The applicable General Plan policy related to operational noise levels is summarized below for the proposed project:

- 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.

Detailed plans for individual buildings are not available at the time of this assessment. However, once detailed building plans are available, the operational noise produced by the operation of buildings must be evaluated with respect to nearby residential land uses. Phase 3 of the project will construct a new administrative building near residential land uses, which will include mechanical equipment that produce noise. According to Policy EC-1.3 of the City of San José General Plan, operational noise generation from new nonresidential land uses must not exceed 55 dBA DNL at nearby property lines. All other new construction associated with the project is not expected to generate noise levels of 55 dBA DNL or higher at nearby property lines.

Traffic Noise

There are no known plans for an increase in the number of students or staff visiting the site. Traffic circulation is expected to remain the same as existing conditions. Thus, there are no expected changes to the noise environment from project-related traffic.

NOISE IMPACTS AND MITIGATION MEASURES

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

Significance Criteria

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

- A 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 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. After a period of 12 months, a significant temporary noise impact would occur if construction noise levels would exceed 80 dBA L_{eq} at residential land uses near the site or 90 dBA L_{eq} at commercial land uses near the site.

    - A significant permanent noise level increase would occur if the project 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 at surrounding receptors. Groundborne vibration levels exceeding 0.08 in/sec PPV would have the potential to result in cosmetic damage to historic buildings, and 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 1: **Temporary Construction Noise.** Existing noise-sensitive land uses would be exposed to a temporary increase in ambient noise levels due to project construction activities. With the implementation of mitigation measures, including GP Policy EC-1.7, this would be considered a **less-than-significant** impact.

Temporary Noise Increases from Project Construction

The City of San Jose 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 activities associated with the Project would occur over a period of approximately 45-and-a-half months. Phase 1 would relocate Berchman's Hall to the southeast corner of W. Hedding Street and Elm Street. Phase 2 would demolish Wade Hall, construct a new academic building in its place, and build a new entry and driveway. Phase 3 would demolish the O'Donnell building and construct a new administrative building in its place. Phase 4 would renovate the interior of Liccardo Center. And Phase 5 would renovate the interior of Matthewson Hall. Construction activities will be conducted consistent with the provisions of the City of San Jose's General Plan and Municipal Code, which limits temporary construction work within 500 feet of residential land uses to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday.

Typical noise levels for different construction equipment at a distance of 50 feet are shown in Table 5. Table 5 levels are consistent with construction noise levels calculated for the project in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM), including the anticipated equipment that would be used for each phase of the project. As indicated in Table 5, excavators, cranes, and backhoes would be anticipated to generate noise level of 80 to 85 dBA L_{max} at a distance of 50 feet. 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. Six nearby receptors (R-1 through R-6) were identified to represent how construction noise levels would vary throughout the duration of the project. These receptor locations are shown in Figure 2. Throughout the duration of the construction, construction noise levels would range from 54 to 67 dBA L_{eq} at R-1, from 54 to 71 dBA L_{eq} at R-2, from 52 to 69 dBA L_{eq} at R-3, from 52 to 66 dBA L_{eq} at R-4, from 55 to 78 dBA L_{eq} at R-5, and from 55 to 70 dBA L_{eq} at R-6. Construction noise levels would not exceed 80 dBA L_{eq} at residential land uses near the site or 90 dBA L_{eq} at commercial land uses near the site. Construction noise levels during each phase are shown below in Tables 6 through 10, and do not assume reductions due to intervening buildings or existing barriers.

Project construction would occur within 500 feet of existing residences and within 200 feet of existing commercial/office uses and would occur for a period exceeding 12 months. With the implementation of GP Policy EC-1.7 and Zoning Code requirements, the temporary construction noise impact would be a **less-than-significant** impact.

Mitigation Measure 1: **None required.**

FIGURE 2 Nearby Receptor and Phase Locations

TABLE 5 Construction Equipment, 50-foot Noise Emission Limits

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

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

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

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

TABLE 6 Construction Noise Levels – Phase 1 – Relocation of Berchman's Hall

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearby Buildings From Operation of Two Loudest Pieces of Construction Equipment at the Center of Construction Zone					
		R-1 (300 feet)	R-2 (185 feet)	R-3 (255 feet)	R-4 (325 feet)	R-5 (280 feet)	R-6 (480 feet)
Demolition (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Preparation (13 days)	Grader (1)* Rubber Tired Dozer (1)* Tractor/Loader/Backhoe (1)	67	71	69	66	68	63
Grading / Excavation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Trenching / Foundation (11 days)	Tractor/Loader/Backhoe (2) Excavator (2)*	64	68	66	64	65	60
Building Exterior (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building Interior / Architectural Coating (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paving (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Denotes two loudest pieces of construction equipment per phase. The two loudest pieces of construction equipment were selected to conservatively represent the entire period.

TABLE 7 Construction Noise Levels – Phase 2 -Demolition of Wade Hall, Construction of New Academic Building, and Build New Entry and Drive

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearby Buildings From Operation of Two Loudest Pieces of Construction Equipment at the Center of Construction Zone					
		R-1 (390 feet)	R-2 (400 feet)	R-3 (525 feet)	R-4 (580 feet)	R-5 (375 feet)	R-6 (440 feet)
Demolition (15 days)	Concrete/Industrial Saw (1)* Excavator (3)* Tractor/Loader/Backhoe (1)	66	66	63	62	66	65
Site Preparation (5 days)	Grader (1)* Rubber Tired Dozer (1)* Tractor/Loader/Backhoe (1)	65	65	62	61	65	64
Grading / Excavation (12 days)	Excavator (1) Grader (1)* Rubber Tired Dozer (1)* Tractor/Loader/Backhoe (1)	65	65	62	61	65	64
Trenching / Foundation (30 days)	Tractor/Loader/Backhoe (1) Excavator (2)*	62	62	59	59	62	61
Building Exterior (132 days)	Crane (1)* Forklift (1) Welder (3)	57	56	54	53	57	56
Building Interior / Architectural Coating (244 days)	Air Compressor (1) Aerial Lift (2)	57	57	54	53	57	56
Paving (10 days)	Paver (1)* Paving Equipment (1)* Roller (1) Tractor/Loader/Backhoe (1)	59	59	57	56	60	58

*Denotes two loudest pieces of construction equipment per phase. The two loudest pieces of construction equipment were selected to conservatively represent the entire period.

TABLE 8 Construction Noise Levels – Phase 3 – Demolition of O'Donnell Hall and Construction of Administrative Buildings

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearby Buildings From Operation of Two Loudest Pieces of Construction Equipment at the Center of Construction Zone					
		R-1 (525 feet)	R-2 (430 feet)	R-3 (460 feet)	R-4 (370 feet)	R-5 (95 feet)	R-6 (235 feet)
Demolition (45 days)	Concrete/Industrial Saw (1)* Excavator (3)* Tractor/Loader/Backhoe (2)	63	65	64	66	78	70
Site Preparation (5 days)	Grader (1)* Rubber Tired Dozer (1) Tractor/Loader/Backhoe (1)*	62	64	63	65	77	69
Grading / Excavation (12 days)	Excavator (1)* Grader (1)* Rubber Tired Dozer (1) Tractor/Loader/Backhoe (1)	62	64	63	65	77	69
Trenching / Foundation (30 days)	Tractor/Loader/Backhoe (1) Excavator (2)*	59	61	61	62	74	66
Building Exterior (88 days)	Crane (1)* Forklift (1) Welder (3)	54	56	55	57	69	61
Building Interior / Architectural Coating (132 days)	Air Compressor (1) Aerial Lift (2)	54	56	55	57	69	61
Paving (10 days)	Paver (1)* Paving Equipment (1) Roller (1)* Tractor/Loader/Backhoe (1)	57	59	58	60	72	64

*Denotes two loudest pieces of construction equipment per phase. The two loudest pieces of construction equipment were selected to conservatively represent the entire period.

TABLE 9 Construction Noise Levels – Phase 4 – Renovation of Liccardo Center Interior

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearby Buildings From Operation of Two Loudest Pieces of Construction Equipment at the Center of Construction Zone					
		R-1 (520 feet)	R-2 (560 feet)	R-3 (685 feet)	R-4 (720 feet)	R-5 (475 feet)	R-6 (465 feet)
Demolition (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Preparation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grading / Excavation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Trenching / Foundation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building Exterior (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building Interior / Architectural Coating (152 days)	Air Compressor (1) Aerial Lift (1)	54	54	52	52	55	55
Paving (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Denotes two loudest pieces of construction equipment per phase. The two loudest pieces of construction equipment were selected to conservatively represent the entire period.

TABLE 10 Construction Noise Levels – Phase 5 – Renovation of Matthewson Hall Interior

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average L_{eq} (dBA) at Nearby Buildings From Operation of Two Loudest Pieces of Construction Equipment at the Center of Construction Zone					
		R-1 (450 feet)	R-2 (280 feet)	R-3 (195 feet)	R-4 (130 feet)	R-5 (275 feet)	R-6 (510 feet)
Demolition (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Site Preparation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grading / Excavation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Trenching / Foundation (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building Exterior (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building Interior / Architectural Coating (152 days)	Air Compressor (1)* Aerial Lift (1)*	56	60	63	66	60	55
Paving (N/A)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Denotes two loudest pieces of construction equipment per phase. The two loudest pieces of construction equipment were selected to conservatively represent the entire period.

Impact 2: Exposure to Excessive Groundborne Vibration during Construction. Construction activities occurring as part of the project could expose sensitive land uses to excessive groundborne vibration. This is a **significant** impact.

The construction of the project may generate vibration levels capable of damaging sensitive structures when heavy equipment or impact tools are used in close proximity. Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

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 0.2 in/sec PPV shall be used to minimize damage at buildings of normal conventional construction. The vibration limits contained in this policy are conservative and designed to provide the ultimate level of protection for existing buildings in San José.

Construction phases utilizing such equipment or tools would include demolition, site preparation, grading, trenching, building construction, and paving. Foundation construction techniques involving impact or vibratory pile driving equipment, which can cause excessive vibration, are not expected with the proposed project.

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 11 presents typical vibration levels that could be expected from construction equipment at a distances of 25 feet to 100 feet. Vibration levels would be higher at distances less than 25 feet and lower at distances greater than 100 feet. Vibration levels would also vary depending on soil conditions, construction methods, and equipment used. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate $(D_{ref}/D)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet.

TABLE 11 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	PPV at 50 ft. (in/sec)	PPV at 100 ft. (in/sec)
Clam shovel drop		0.202	0.094	0.044
Hydromill (slurry wall)	in soil	0.008	0.004	0.002
	in rock	0.017	0.008	0.004
Vibratory Roller		0.210	0.098	0.046
Hoe Ram		0.089	0.042	0.019
Large bulldozer		0.089	0.042	0.019
Caisson drilling		0.089	0.042	0.019
Loaded trucks		0.076	0.035	0.017
Jackhammer		0.035	0.016	0.008
Small bulldozer		0.003	0.001	0.001

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

Table 12 summarizes the minimum safe setback distances to maintain in order to achieve the 0.08 in/sec PPV threshold for historical buildings and the 0.2 in/sec threshold for buildings of normal conventional construction.

TABLE 12 Vibration Source Levels for Construction Equipment and Minimum Safe Setbacks

Equipment		PPV at 25 ft. (in/sec)	Minimum Safe Setback (feet) 0.08 in/sec PPV	Minimum Safe Setback (feet) 0.20 in/sec PPV
Clam shovel drop		0.202	59	26
Hydromill (slurry wall)	in soil	0.008	4	2
	in rock	0.017	7	3
Vibratory Roller		0.210	61	27
Hoe Ram		0.089	28	13
Large bulldozer		0.089	28	13
Caisson drilling		0.089	28	13
Loaded trucks		0.076	24	11
Jackhammer		0.035	12	6
Small bulldozer		0.003	2	<1
Small Vibratory Roller (CAT CP433E 8-ton vibratory compactor)		0.087	27	12
Pavement Grinder		0.089	28	13

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., May 2022.

A review of the City of San José Historic Resource Inventory[2] identified five historic properties in the site vicinity; 872 Myrtle Street and 944, 970, 992, and 993 University Avenue. The nearest historic building is at 872 Myrtle Street, which would be located about 50 feet from Phase 5 (renovate Matthewson Hall interior). No heavy equipment will be used in this phase, and the 0.08 in/sec PPV threshold would not be exceeded. Therefore, construction activities associated with Phase 5 would not result in a significant impact at the historic building located at 872 Myrtle Street.

944 University Avenue is the second closest historic structure to proposed construction areas. This historic building would be located approximately 150 feet from Phase 3 (Demolition of O'Donnell Hall and Construction of Administrative Buildings). At 150 feet, vibration levels could reach 0.029 in/sec PPV and would not and exceed the 0.08 in/sec PPV threshold. All other historic properties in the site vicinity would be located more than 100 feet from proposed construction activities would not be subject to vibration levels exceeding 0.08 in/sec PPV.

Buildings of normal conventional construction, located at 878, 884, 896, and 898 Myrtle Street, and at 931,945, 959 and 971 University Avenue would adjoin the project site and could potentially be exposed to vibration levels exceeding 0.2 in/sec PPV when construction activities occur within

2 City of San José Historic Resources Inventory, https://www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/historic-preservation/historic-resources-inventory

30 feet. All other structures in the project vicinity would be located further than 30 feet from the primary work area, and groundborne vibration levels attributable to project construction would not exceed the 0.20 in/sec PPV threshold for conventional buildings. Neither cosmetic, minor, or major damage would occur at conventional buildings located 30 feet or more from the project site.

At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration during hours with the least potential to affect nearby businesses, perceptible vibration can be kept to a minimum.

Mitigation Measure 2:

The following measures shall be implemented during construction to reduce vibration levels to 0.2 in/sec PPV or less at 878, 884, 896, and 898 Myrtle Street, and at 959 and 971 University Avenue.

- Place operating equipment on the construction site as far as possible from vibration-sensitive receptors.
- Use smaller vibratory rolling equipment, for example the Caterpillar model CP433E vibratory compactor, within 60 feet of historic buildings or within 30 feet of normal buildings.
- Select demolition methods not involving impact tools.
- Avoid dropping heavy equipment within 60 feet of historic buildings or within 30 feet of normal buildings, and use alternative methods for breaking up existing pavement, such as a pavement grinder.
- Hoe rams, large bulldozers, drill rigs, loaded trucks, and other similar equipment shall not be used within 15 feet of adjacent buildings.
- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

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

Impact 3: **Excessive Aircraft Noise.** The project site is located approximately 0.5 miles south of Norman Y. Mineta San José International Airport. Aircraft noise levels at the project site would not be considered to be excessive. **This is a less-than-significant impact.**

Norman Y. Mineta San José International Airport is a public-use airport located approximately 0.5 miles north of the project site. According to the new Airport Master Plan Environmental Impact

Report,[3] the project site lies just outside the 60 dBA CNEL contour line (see Figure 3). Aircraft noise would result in exterior noise levels below the City and County's requirements for residential and educational land uses. Future exterior noise levels due to aircraft would be compatible with the proposed land uses resulting in a less-than-significant impact.

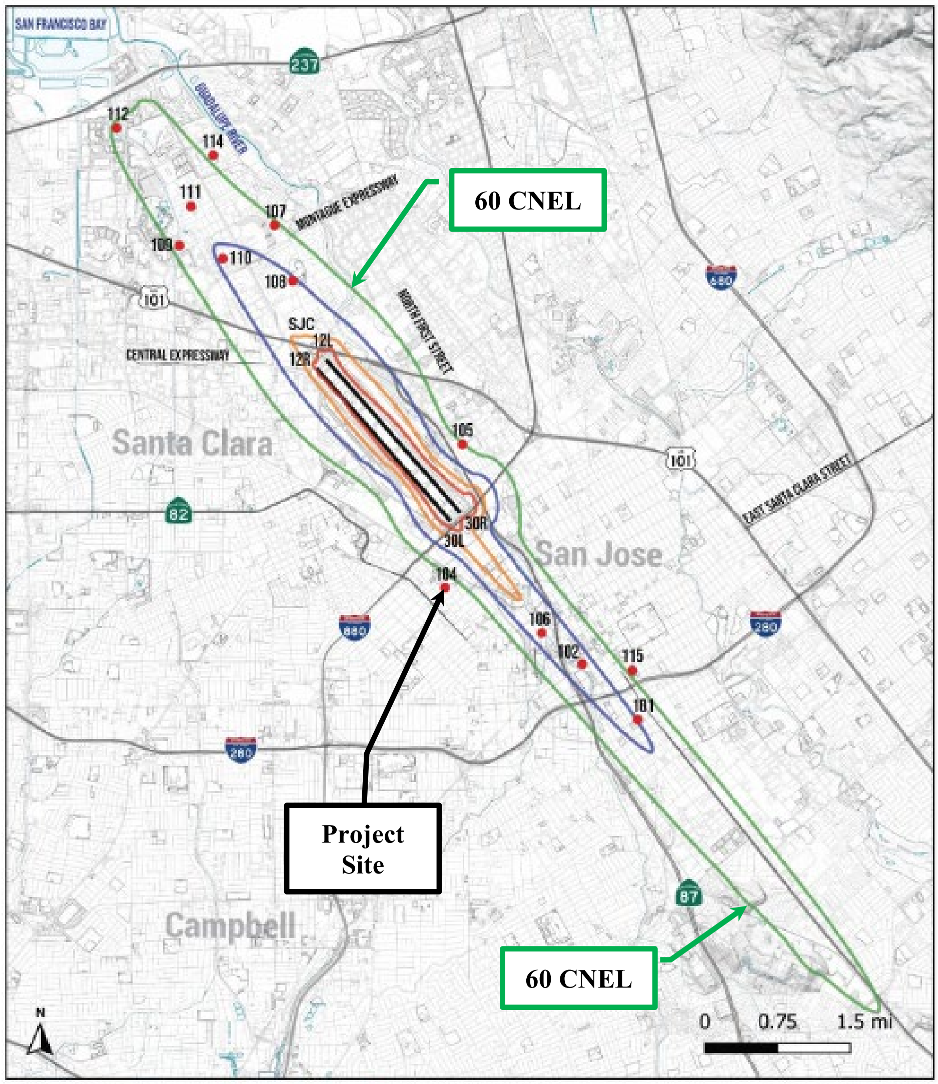
Mitigation Measure 3: None required.

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

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

Figure 5
Scenario 2: With Project 2037 Noise Contour Map

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



NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

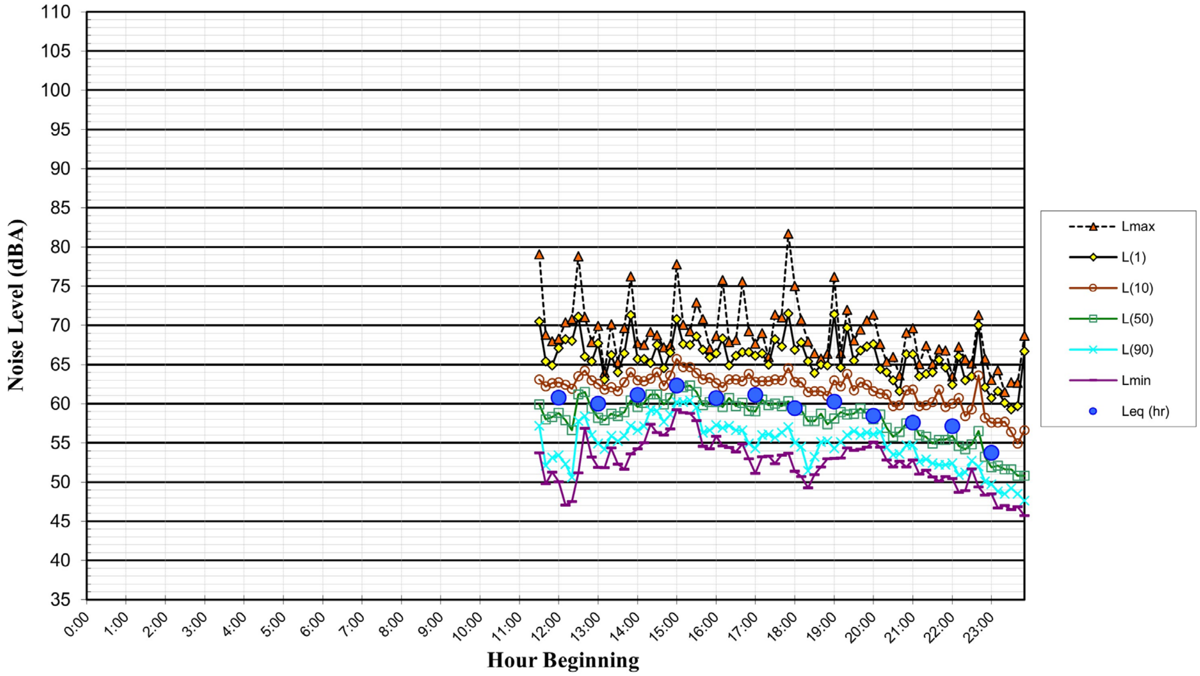
- Noise Monitoring Station
- 101 Site ID
- Runway
- 75 dBA and Greater CNEL Contour
- 70 dBA and Greater CNEL Contour
- 65 dBA and Greater CNEL Contour
- 60 dBA and Greater CNEL Contour

Figure 5 Scenario 2: With Project 2037 Noise Contour Map

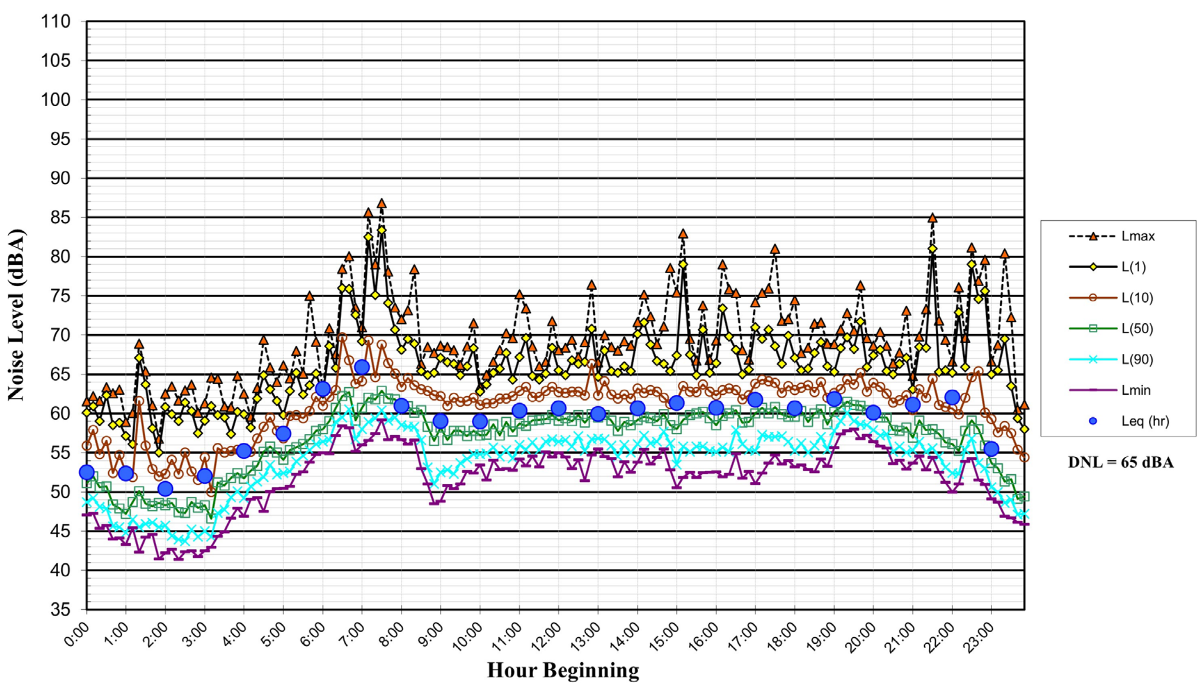
Source: BridgeNet International 2019

Appendix A

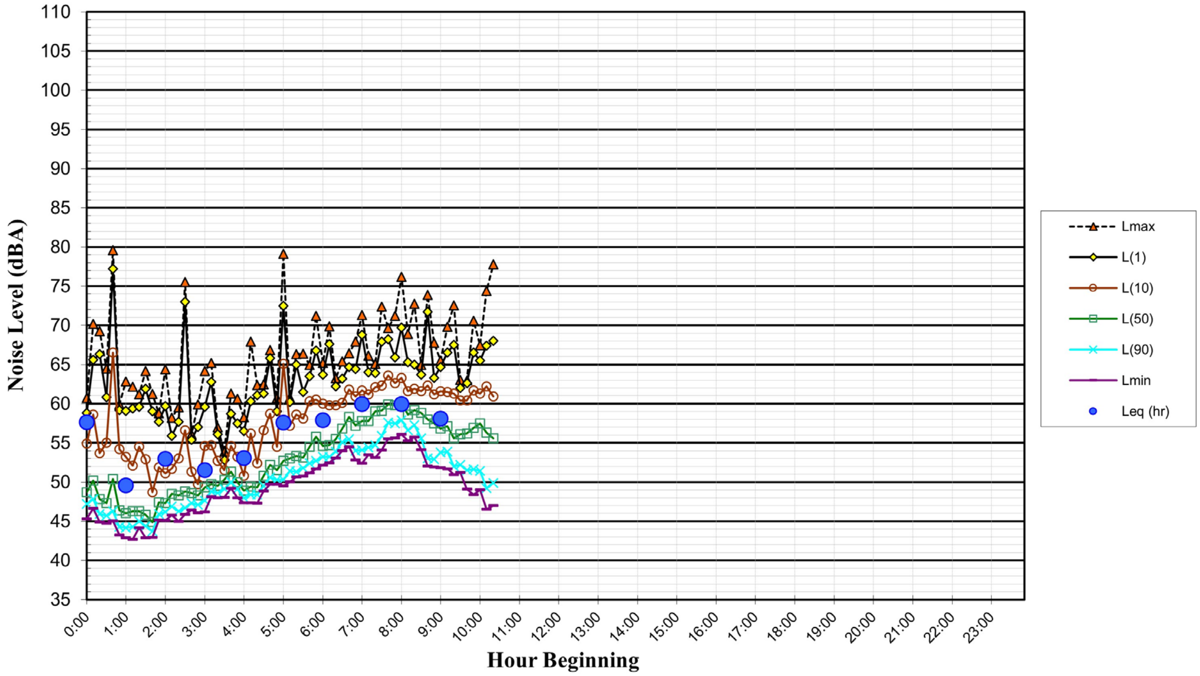
Noise Levels at Noise Measurement Site LT-1
~145 Feet from the Centerline of W Hedding Street
Wednesday, November 2, 2022



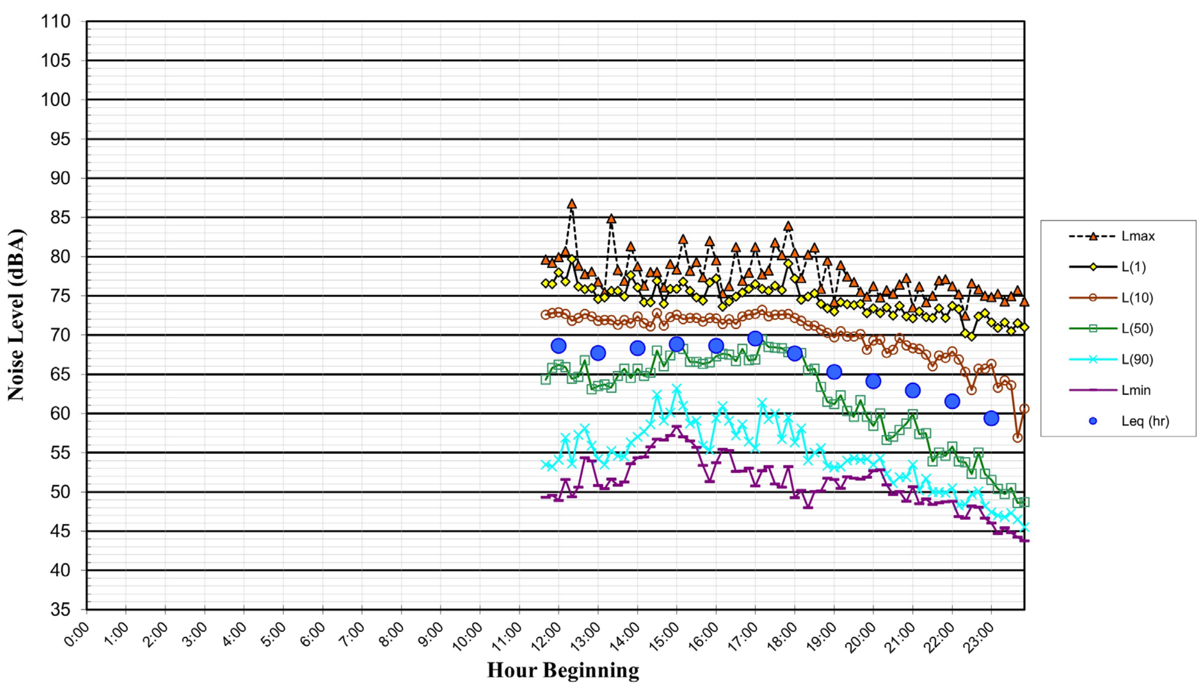
Noise Levels at Noise Measurement Site LT-1
~145 Feet from the Centerline of W Hedding Street
Thursday, November 3, 2022



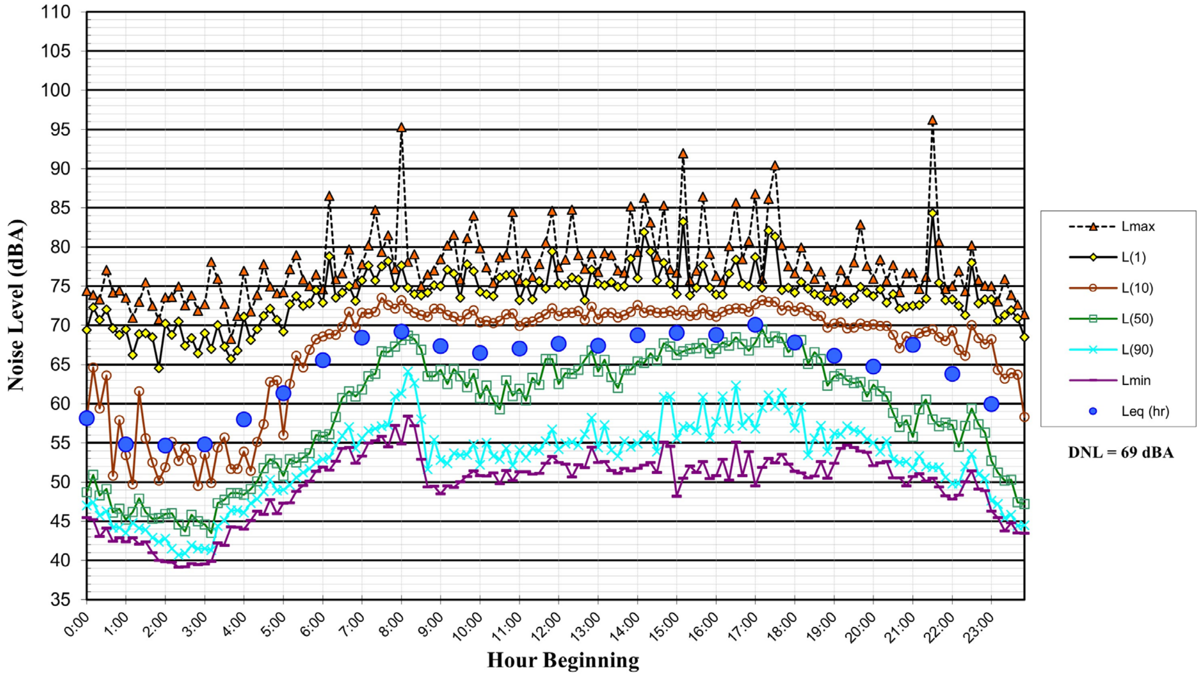
Noise Levels at Noise Measurement Site LT-1
~145 Feet from the Centerline of W Hedding Street
Friday, November 4, 2022



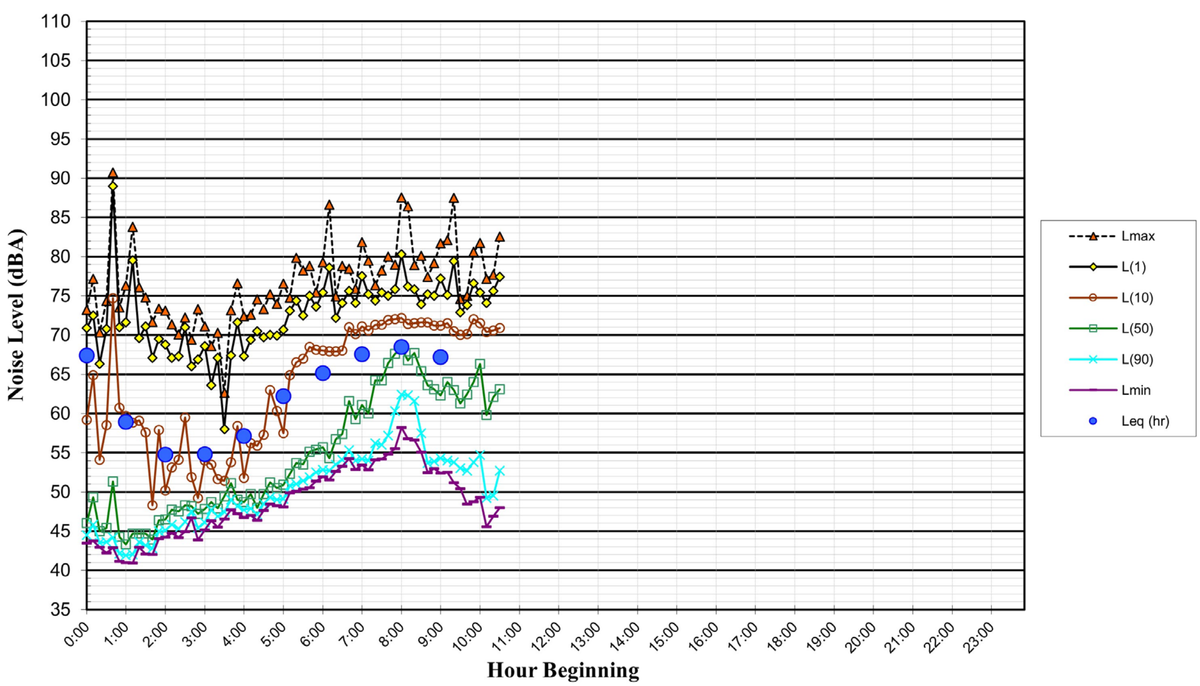
Noise Levels at Noise Measurement Site LT-2
~40 Feet from the Centerline of W Hedding Street
Wednesday, November 2, 2022



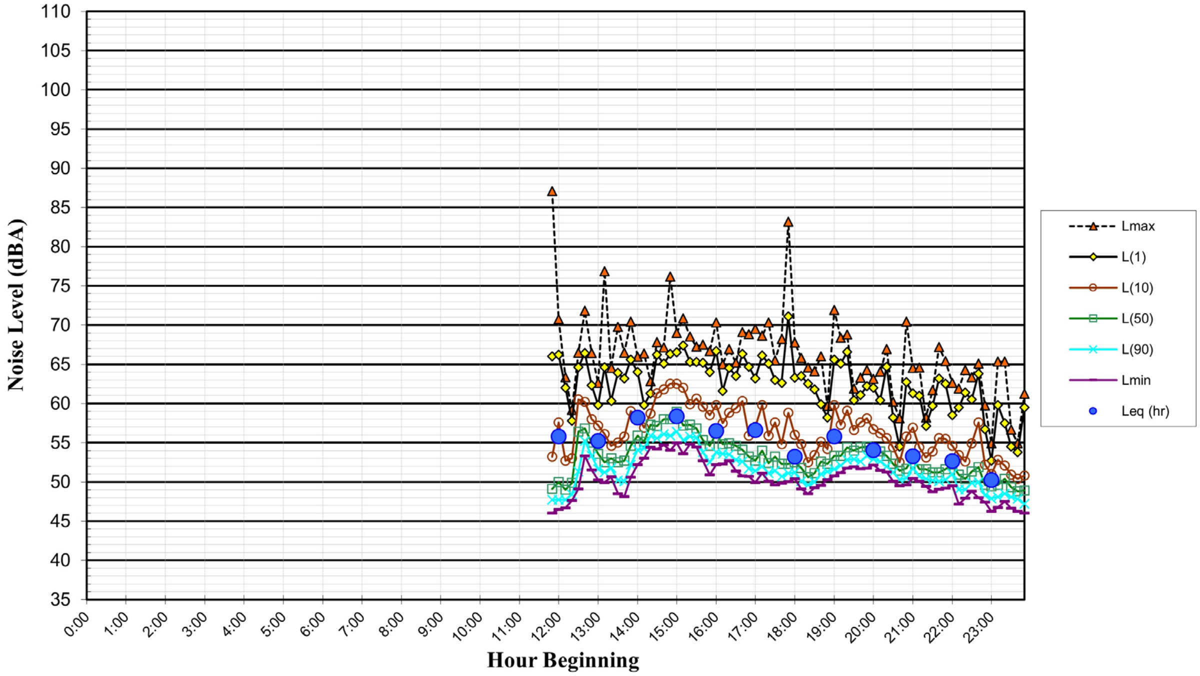
Noise Levels at Noise Measurement Site LT-2
~40 Feet from the Centerline of W Hedding Street
Thursday, November 3, 2022



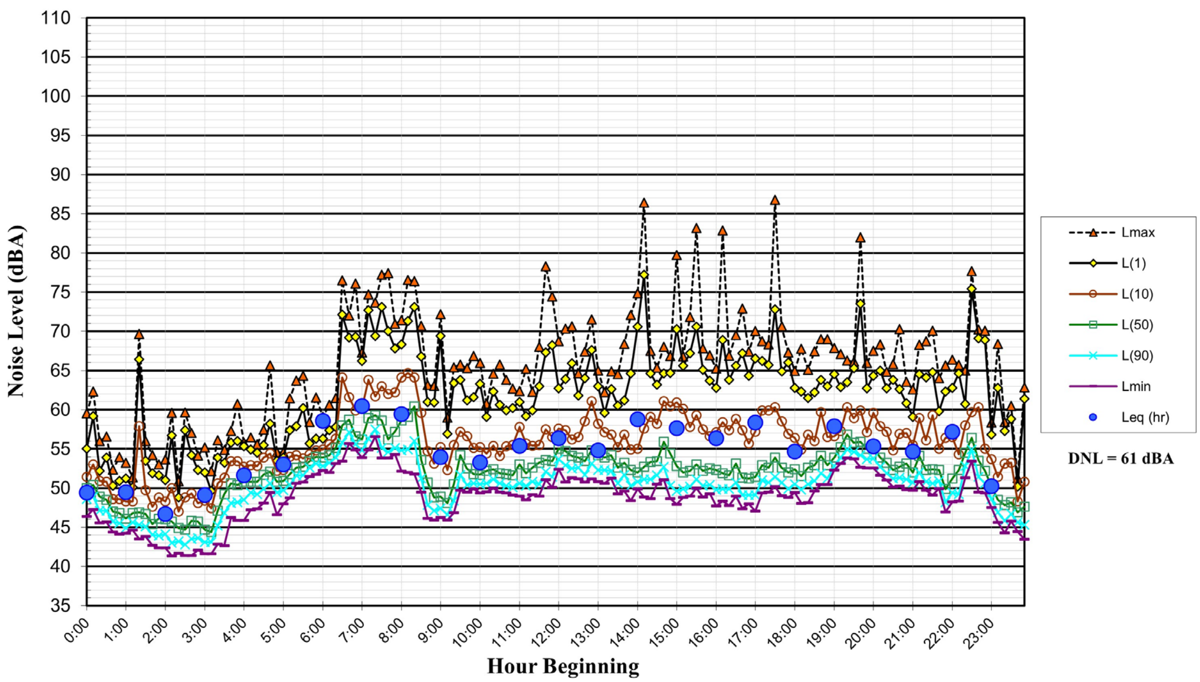
Noise Levels at Noise Measurement Site LT-2
~40 Feet from the Centerline of W Hedding Street
Friday, November 4, 2022

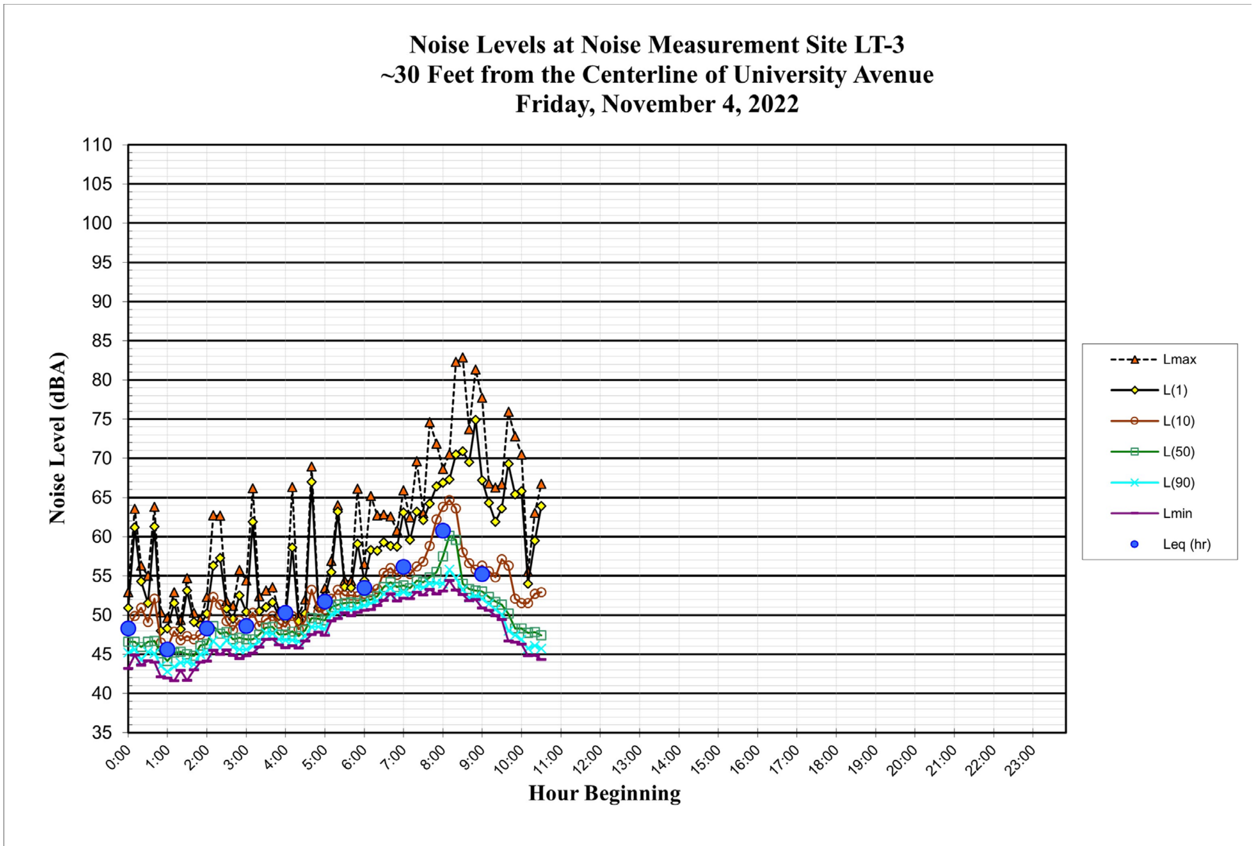


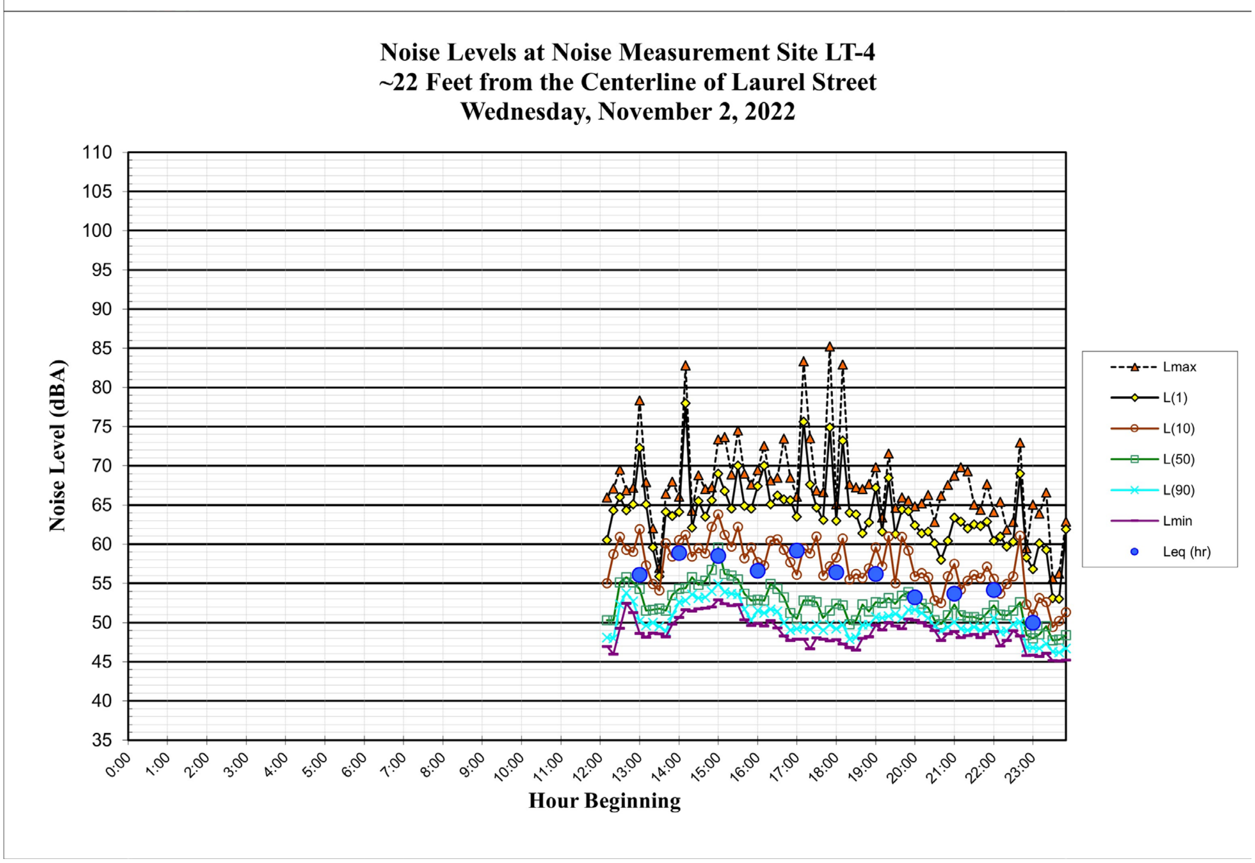
Noise Levels at Noise Measurement Site LT-3
~30 Feet from the Centerline of University Avenue
Wednesday, November 2, 2022

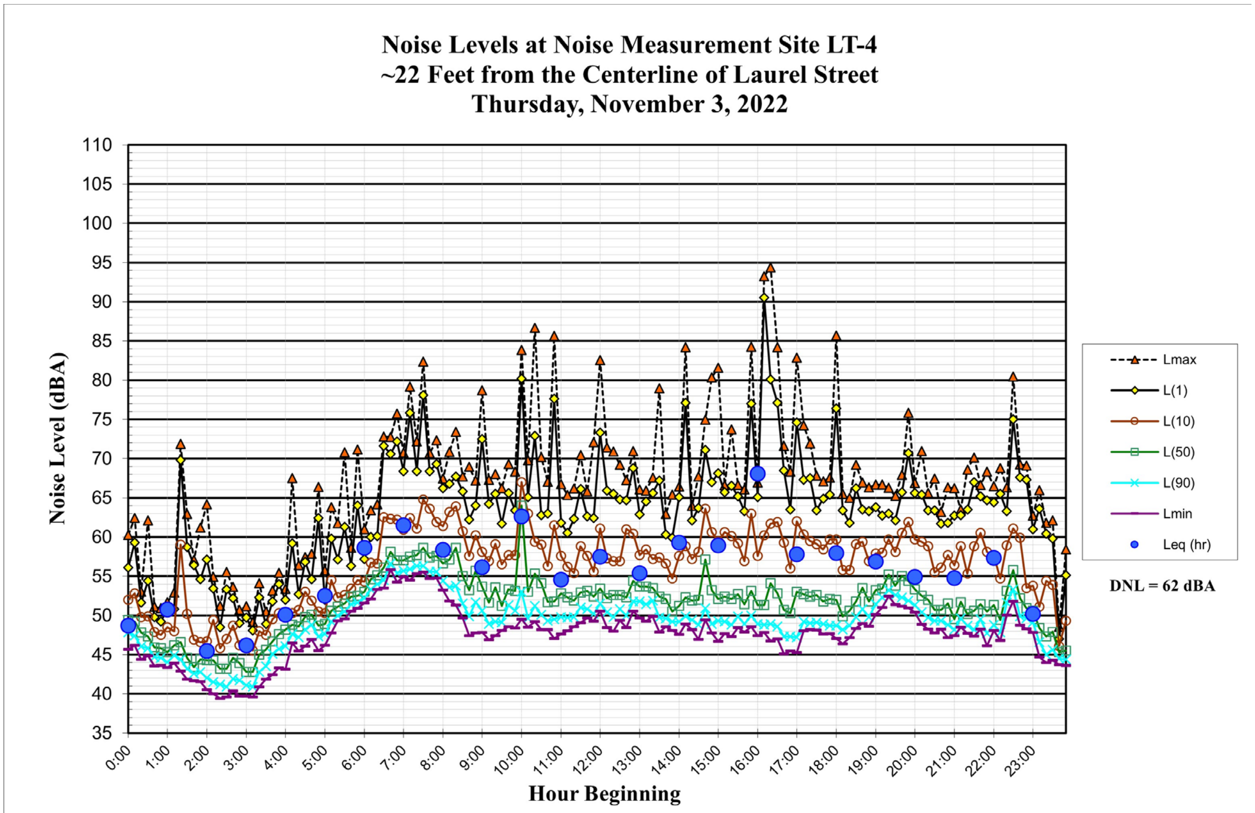


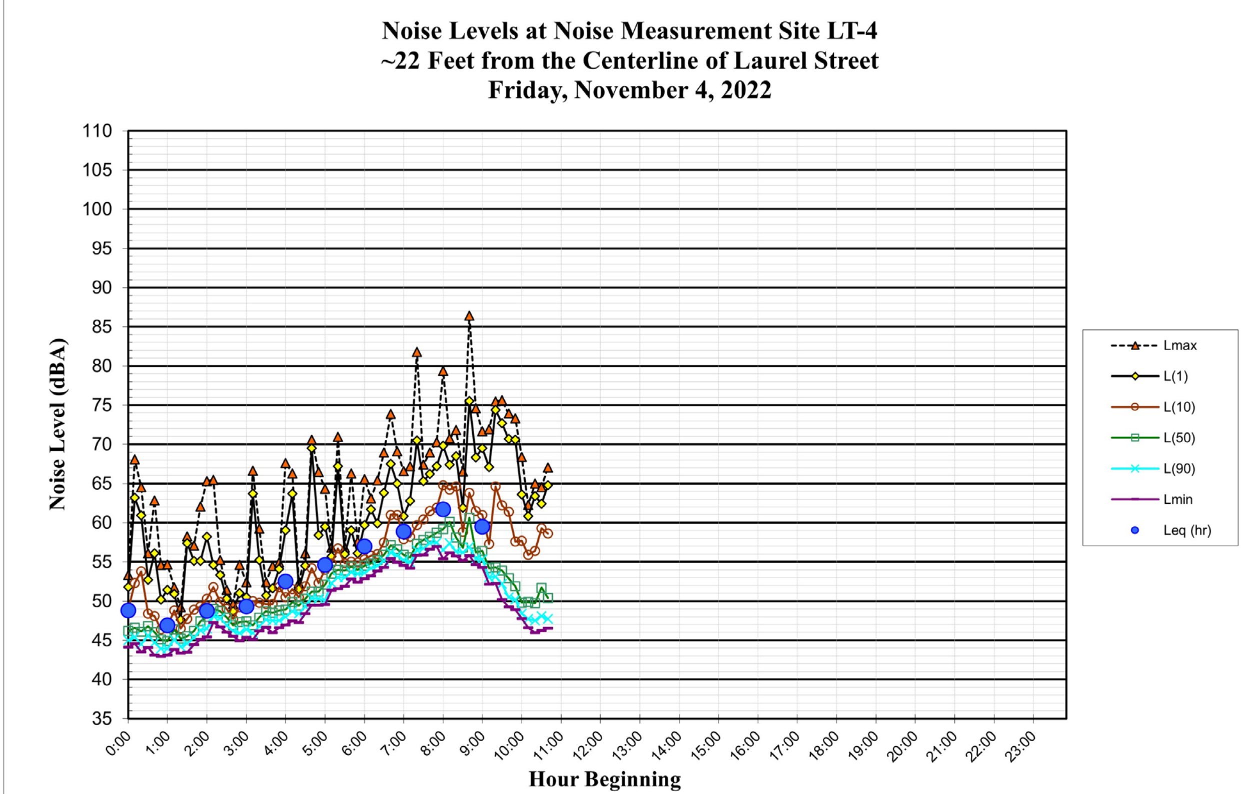
Noise Levels at Noise Measurement Site LT-3
~30 Feet from the Centerline of University Avenue
Thursday, November 3, 2022




Noise Levels at Noise Measurement Site LT-3
~30 Feet from the Centerline of University Avenue
Friday, November 4, 2022
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)


Noise Levels at Noise Measurement Site LT-4
~22 Feet from the Centerline of Laurel Street
Wednesday, November 2, 2022
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)


Noise Levels at Noise Measurement Site LT-4
~22 Feet from the Centerline of Laurel Street
Thursday, November 3, 2022
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 62 dBA


Noise Levels at Noise Measurement Site LT-4
~22 Feet from the Centerline of Laurel Street
Friday, November 4, 2022
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)