Appendix F

Noise and Vibration Study

FIVE WOUNDS URBAN VILLAGE PLAN UPDATE NOISE AND VIBRATION ASSESSMENT SAN JOSÉ, CALIFORNIA

February 21, 2025

♦ ♦ ♦

Prepared for:

Matthew Moore
Project Manager III
Circlepoint
1625 Clay Street, Suite 700
Oakland, CA 94612

Prepared by:

Carrie J. Janello and
Michael S. Thill

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

I&R Job No.: 24-013

INTRODUCTION

The City of San José is proposing to update the Five Wounds Urban Village Plan, consistent with the Envision San José 2040 General Plan. The Five Wounds Urban Village Plan Update (the Project) is located within an approximately half-mile radius surrounding the future 28th Street/ Little Portugal BART Station (see Figure 1). The Plan Area is generally bounded by King Road to the east; Lower Silver Creek to the north; Coyote Creek to the west; and East San Fernando Street, East William Court, and East San Antonio Street to the south. The Plan Area encompasses four existing Urban Villages:

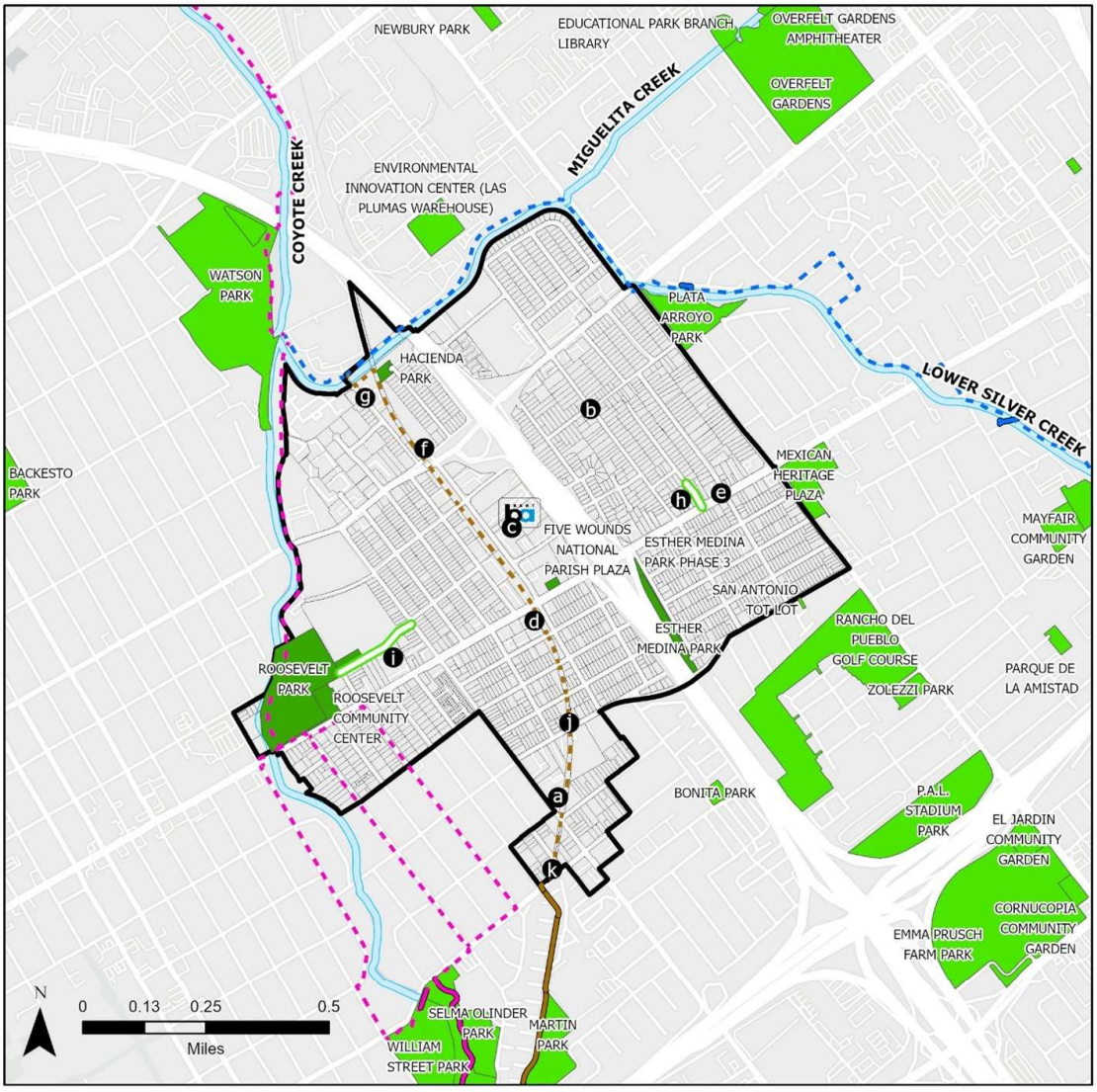
- Five Wounds Urban Village Plan, which is located north of East Santa Clara Street and contains the site of the future BART station;
- Roosevelt Park Urban Village Plan, which is located east of Bayshore Freeway (US 101) along Alum Rock Avenue;
- Little Portugal Urban Village Plan, which is located west of Bayshore Freeway along East Santa Clara Street; and
- 24th and William Urban Village Plan, which is located south of East Santa Clara Street along the Union Pacific Railroad (UPRR) corridor.

All four existing Urban Villages will be updated and consolidated into a new Five Wounds Urban Village Plan.

The Project anticipates accommodating 2,000 new jobs and 6,000 housing units. To accomplish this, the newly formed Five Wounds Urban Village Plan will modify the total aggregate of housing and jobs capacities in the existing four Urban Village Plans from 4,855 jobs and 2,022 housing units to the new proposed jobs and housing capacities. The Project's primary goals include:

- Preserve the neighborhood character of each of the existing four Urban Village's Plan areas.
- Preserve small businesses and affordable housing as new development occurs around the future BART station.
- Support and organize new development to create a mix of housing and employment opportunities.
- Facilitate and support affordable housing efforts for current residents.
- Incorporate land use policies that support anti-displacement efforts for affordable housing and small businesses, where feasible.
- Incorporate adequate parking management strategies and policies to reduce parking and optimize the use of all future parking, benefiting current and future community members, transit and future BART transit users, and other visitors.
- Plan and better define the Five Wounds Trail alignment and design character on or adjacent to the former UPRR corridor to provide a park trail, green space, an alternative circulation route for bicyclists and pedestrians, and other public health benefits.
- Reduce parking and disincentivize driving to promote pedestrian-oriented, bicycle-friendly, and transit-centric communities within the Plan Area.
- Implement the recommendations of the Valley Transit Authority's (VTA) Transit Oriented Community (TOC) Playbook.

FIGURE 1 Project Study Area



Currently, eight major development projects are located within the Five Wounds Urban Village boundaries, of which one is under construction, six are approved, and one is pending approval. Major development projects are those which propose one of the following: over 50 dwelling units, over 25,000 square feet of commercial area, or over 75,000 square feet of industrial area. Table 1 summarizes these eight major development projects.

TABLE 1 Eight Major Development Projects Located Within the Plan Area

APN	File Name	Filing Date	Project Name	Address	Status	No. of Units
24966040	H21-050	2/13/2022	1298 Tripp Avenue	1298 Tripp Avenue	Approved	235
24965060	H22-011	3/1/2022	1347 East Julian Street	1347 East Julian Street	Approved	45
46730038	MP22-013	11/16/2022	Affordable and Supportive Housing	934 East Santa Clara Avenue	Approved	103
46711021	H20-001	1/3/2020	Dahlia Apartments	1135 East Santa Clara Street	Approved	91
46712001	SP17-027	6/26/2017	Roosevelt Park Apartments	21 North 21st Street	Under Construction	80
24965061	H22-012	3/29/2022	1325 East Julian Street	1325 East Julian Street	Approved	633
46709076	SP22-004	3/21/2022	70 North 27th Street	70 North 27th Street	Approved	198
24966010	H22-034	7/26/2022	1271 East Julian Street	1271 East Julian Street	Pending	140

This report evaluates the plan'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 and groundborne vibration, summarizes applicable regulatory criteria, and discusses the results of the ambient noise surveys completed to document existing noise conditions; 2) the General Plan Consistency Section discusses the land use compatibility of the plan, with regard to noise and vibration, utilizing policies in the City's General Plan; and 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate impacts upon sensitive receivers, provides a discussion of each impact, and presents measures, where feasible, to mitigate the identified 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 the 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 2.

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 3. 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* (*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 12-17 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 57-62 dBA DNL with open windows and 65-70 dBA DNL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 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 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a DNL of 60-70 dBA. Between a DNL of 70-80 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 30-35 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 2 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 3 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 is the Peak Particle Velocity (PPV) and another is the Root Mean Square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. 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 4 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The annoyance levels shown in Table 4 should be interpreted with care since vibration may be found to be annoying at much 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. In high noise environments, that are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans (60 to 70 VdB). Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams and foot traffic. Table 4 illustrates some common sources of vibration and the association to human perception or the potential for structural damage. Construction activities, train operations, and heavy truck and bus traffic are some of the most common external sources of vibration that can be perceptible inside residences.

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 induce structural 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. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. 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.

TABLE 4 Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB	Typical Events (50-foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
		Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, occasional events		Commuter rail, typical Bus or truck over bump or on rough roads
Residential annoyance, frequent events	70	Rapid transit, typical
Approximate human threshold of perception to vibration		Buses, trucks and heavy street traffic
	60	
		Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

Source: Transit Noise and Vibration Impact Assessment, US Department of Transportation Federal Transit Administration, September 2018.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. 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.

Table 5 displays continuous vibration impacts on human annoyance and on buildings. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much 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.

TABLE 5 Reactions 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.

Rail Vibration

Railroad operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground vibration has been correlated best with the RMS velocity level of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1×10^{-6} in/sec RMS, that equals 0 VdB, and 1 in/sec equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration levels in decibels to reduce the potential for confusion with airborne sound levels in decibels.

One of the problems with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and more importantly human annoyance inside buildings. The U.S. Department of Transportation (U.S. DOT) Federal Transit Administration (FTA) has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These limits are summarized in Table 6. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events; a passenger train lasts a few seconds whereas a long freight train may last several minutes, depending on speed and length.

TABLE 6 FTA Groundborne Vibration Impact Criteria

Land Use Category	Impact Levels (VdB re 1 micro-inch /sec)		
	Frequent Events[1]	**Occasional Events[2]**	**Infrequent Events[3]**
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Source: US Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018.

Notes:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events per day. This category includes most commuter rail systems.
4. This limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

Vibration from Heavy Trucks and Buses

Groundborne vibration levels from heavy trucks and buses are not normally perceptible, especially if roadway surfaces are smooth. Buses and trucks typically generate groundborne vibration levels to about 63 VdB at a distance of 25 feet when traveling at a speed of 30 mph. Higher vibration levels can occur when buses or trucks travel at higher rates of speed or when the pavement is in poor condition. Vibration levels below 65 VdB are not normally perceptible.

Regulatory Background – Noise

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

Federal Government

Federal Transit Administration (FTA)

The 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, 85 dBA L_{eq} at commercial and office land uses, and to 90 dBA L_{eq} at industrial land uses.

State

2022 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 L_{dn}/DNL/CNEL in any habitable room.

Division of Aeronautic Noise Standards

Title 21 of the California Code of Regulations[2] sets forth the State's airport noise standards. In the findings described in Section 5006, the standard states the following: "A level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dB for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction." Based on this finding, the airport noise standard as defined in Section 5012 is set at a CNEL of 65 dBA.

CEQA Guidelines

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

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

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

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport

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

2 California Code of Regulations Airport Noise Standards, Title 21, Public Works Division 2.5, Division of Aeronautics (Department of Transportation), Chapter 6 Noise Standards, Article 1.General.

or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

2022 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 2022 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). The sections that pertain to this project are as follows:

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

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

Santa Clara County

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

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

4.3.2.1 Noise Compatibility Policies

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

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

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

N-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.)

N-5 All property owners within the Airport Influence Area who rent or lease their property for residential use shall include in their rental/lease agreement with the tenant, a statement advising that they (the tenants) are living within a high noise area and the exterior noise level is predicted to be greater than 65 dB CNEL in a manner that is consistent with current state law including AB2776 (2002).

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.

N-7 Single-event noise levels (SENL) from single aircraft overflights are also to be considered when evaluating the compatibility of highly noise-sensitive land uses such as schools, libraries, outdoor theaters, and mobile homes. Single-event noise levels are especially important in the areas regularly overflown by aircraft, but which may not produce significant CNEL contours, such as the down-wind segment of the traffic pattern, and airport entry and departure flight corridors.

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 Jose International Airport, May 25, 2011, Amended November 16, 2016.

Local

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.

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

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

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

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

Normally Acceptable:

- Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable:

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

Unacceptable:

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

Source: Envision San Jose 2040 General Plan, Adopted November 1, 2011, As Amended on February 27, 2018.

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

EC-1.5 Encourage the State Department of Transportation and County transportation agencies to provide visually pleasing sound attenuation devices on all new and existing freeways and expressways.

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-1.8 Allow commercial drive-through uses only when consistency with the City's exterior noise level guidelines and compatibility with adjacent land uses can be demonstrated.

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

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.

EC-1.14 Require acoustical analyses for proposed sensitive land uses in areas with exterior noise levels exceeding the City's noise and land use compatibility standards to base

noise attenuation techniques on expected Envision General Plan traffic volumes to ensure land use compatibility and General Plan consistency.

City of San José Municipal Code

Title 20 of the City's Municipal Code provides noise performance standards for the City of San José. The following sections are applicable to the proposed Project:

Section 20.20.300 Performance Standards

B. Without limiting the generality of the preceding subsection, the following specific standards shall apply in the Open Space and Agricultural Zoning Districts:

2. Noise. The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-45 at any property line, except upon issuance and in compliance with a Conditional Use Permit as provided in Chapter 20.100.

Table 20-45 Additional Noise Standards	
	Maximum Noise Level in Decibels at Property Lines
Open Space or Agricultural use adjacent to a property used or zoned for residential purposes	55
Open Space or Agricultural use adjacent to a property used or zoned for commercial purposes	60
Open Space or Agricultural use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes	70

Section 20.30.700 Performance Standards

B. Without limiting the generality of the preceding subsection, the following specific standards shall apply in the Residential Zoning Districts:

2. Noise. The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-85 at any property line, except upon issuance and in compliance with a Conditional Use Permit as provided in Chapter 20.100.

Table 20-85 Noise Standards	
	Maximum Noise Level in Decibels at Property Lines
Any residential or nonresidential use	55

Section 20.40.600 Performance Standards

B. Without limiting the generality of the preceding subsection, the following specific standards shall apply in the Commercial Zoning Districts:

2. Noise. The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-105 at any property line, except upon issuance and in compliance with a Conditional Use Permit as provided in Chapter 20.100.

Table 20-105 Noise Standards	
	Maximum Noise Level in Decibels at Property Lines
Commercial use adjacent to a property used or zoned for residential purposes	55
Commercial use adjacent to a property used or zoned for commercial or other nonresidential purposes	60

Section 20.50.300 Performance Standards

B. Without limiting the generality of the preceding subsection, the following specific standards shall apply in the Industrial Zoning Districts:

4. Noise. The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-135 at any property line, except upon issuance and in compliance with a Conditional Use Permit as provided in Chapter 20.100.

Table 20-135 Noise Standards	
	Maximum Noise Level in Decibels at Property Lines
Industrial use adjacent to a property used or zoned for residential purposes	55
Industrial use adjacent to a property used or zoned for commercial or other nonresidential purposes	60
Industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes	70

Regulatory Background – Vibration

Federal Government

Federal Transit Administration (FTA)

The FTA has identified vibration impact criteria for sensitive buildings, residences, and institutional land uses near rail transit and railroads. The thresholds for residences and buildings where people normally sleep (e.g., nearby residences) are 72 VdB for frequent events (more than 70 events of the same source per day), 75 VdB for occasional events (30 to 70 vibration events of the same source per day), and 80 VdB for infrequent events (less than 30 vibration events of the same source per day).

State

California Department of Transportation (Caltrans) – Construction Vibration

Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards. A conservative vibration limit of 0.25 to 0.30 in/sec PPV has been used for older buildings that are found to be structurally sound but cosmetic damage to plaster ceilings or walls is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a conservative limit of 0.08 in/sec PPV is often used to provide the highest level of protection. All of these limits have been used successfully and compliance to these limits has not been known to result in appreciable structural damage. All vibration limits referred to herein apply on the ground level and take into account the response of structural elements (i.e. walls and floors) to groundborne excitation.

Local

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-2.1 Near light and heavy rail lines or other sources of ground-borne vibration, minimize vibration impacts on people, residences, and businesses through the use of setbacks and/or structural design features that reduce vibration to levels at or below the guidelines of the Federal Transit Administration. Require new development within 100 feet of rail lines to demonstrate prior to project approval that vibration experienced by residents and vibration sensitive uses would not exceed these guidelines.

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 existing noise environment within the Plan Area results primarily from traffic along US 101, Santa Clara Street/Alum Rock Avenue, and Julian Street/McKee Road. Traffic on 24th Street, King Road, and other minor roads also contributes to the noise environment. UPRR tracks transecting the Plan Area are no longer active and do not contribute to the existing noise environment. Aircraft associated with the San José Mineta International Airport, which is located 2.2 miles northwest of the Plan Area, and operational noise from surrounding industrial land uses also contributes to the noise environment.

A noise monitoring survey consisting of four long-term (LT-1 through LT-4) and seven short-term (ST-1 through ST-7) noise measurements was conducted within the study area and vicinity between Wednesday, May 15, 2024, and Friday, May 17, 2024. All noise measurement locations are shown in Figure 2. The locations of noise measurements were chosen to fully represent existing noise levels at sites within the study area.

Long-term noise measurement LT-1 was made approximately 55 feet south of McKee Road, between North 33rd Street and North 34th Street. McKee Road traffic was the main source of noise at this location. Hourly average noise levels typically ranged from 66 to 73 dBA L_{eq} during daytime hours (7:00 a.m. and 10:00 p.m.) and from 59 to 72 dBA L_{eq} during nighttime hours (10:00 p.m. and 7:00 a.m.). The day-night average noise level on Thursday, May 16, 2024, was 73 dBA L_{dn}. The daily trend in noise levels at LT-1 is shown in Figures A1 through A3 in Appendix A.

Long-term noise measurement LT-2 was made at the end of Five Wounds Lane, approximately 130 feet from the centerline of the nearest through lane of US 101. LT-2 was made behind a 10-foot sound wall that runs along US 101. US 101 was the main source of noise at this location. Hourly average noise levels typically ranged from 67 to 75 dBA L_{eq} during daytime hours and from 68 to 74 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday,

May 16, 2024, was 78 dBA L_{dn}. The daily trend in noise levels at LT-2 is shown in Figures A4 through A6 in Appendix A.

Long-term noise measurement LT-3 was made approximately 30 feet north of the centerline of East Santa Clara Street between South 22nd Street and South 23rd Street. East Santa Clara Street was the main source of noise at this location. Hourly average noise levels typically ranged from 68 to 75 dBA L_{eq} during daytime hours and from 58 to 70 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday, May 16, 2024, was 72 dBA L_{dn}. The daily trend in noise levels at LT-3 is shown in Figures A7 through A9 in Appendix A.

Long-term noise measurement LT-4 was made approximately 20 feet east of the centerline of South 24th Street between Peach Court and East William Court. South 24th Street was the main source of noise at this location. Hourly average noise levels typically ranged from 62 to 73 dBA L_{eq} during daytime hours and from 56 to 68 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday, May 16, 2024, was 70 dBA L_{dn}. The daily trend in noise levels at LT-4 is shown in Figures A10 through A12 in Appendix A.

Short-term noise measurements were made on Wednesday, May 15, 2024, between 10:30 a.m. and 12:40 p.m. in 10-minute intervals. Results of the measurements are summarized in Table 7.

Short-term noise measurement ST-1 was made approximately 35 feet south of the centerline of East San Antonio Street in front of the Brookwood Terrace Apartments. Local traffic and jets were the dominant noise sources at ST-1. Traffic noise from East San Antonio Street ranged from 60 to 75 dBA, and jets generated noise levels of 52 to 58 dBA. A car horn was measured at ST-1 to be 75 dBA. The 10-minute L_{eq} measured at ST-1 was 60 dBA.

ST-2 was made approximately 30 feet west of the centerline of South 28th Street between Shortridge Avenue and East San Fernando Street. Local traffic and airplanes were the dominant noise sources at ST-2. Traffic noise from South 28th Street ranged from 60 to 69 dBA, and a plane flyover generated noise levels of 53 dBA. Background traffic noise from US 101 ranged from 50 to 56 dBA at ST-2. The 10-minute L_{eq} was 58 dBA.

ST-3 was made approximately 25 feet east of the centerline of North 24th Street between 162 North 24th Street and 150 North 24th Street. Local traffic noise, neighborhood activities, jets, and birds were the noise sources at ST-3. Traffic noise from North 24th Street generated noise levels of 60 to 72 dBA. A jet flyover generated noise levels of 56 dBA, and birds generated noise levels of 45 to 54 dBA. Pedestrians walking along the sidewalk, talking, generated noise levels of less than 51 dBA. The 10-minute L_{eq} measured at ST-3 was 59 dBA.

ST-4 was made approximately 25 feet east of the centerline of North 26th Street from the sidewalk in front of 210 North 26th Street. Local traffic noise, aircraft, and birds were the noise sources at ST-4. Traffic noise from North 26th Street generated noise levels of 60 to 64 dBA. A jet flyover generated noise levels of 56 dBA, and an airplane flyover generated noise levels of 55 dBA. Birds generated noise levels of 45 to 50 dBA. Additionally, a saw was observed during the ST-4 measurement to produce noise levels of 46 to 49 dBA. A distant siren was observed to generated

noise levels of 50 dBA at ST-4, and distant traffic from US 101 generated noise levels of 45 to 56 dBA. The 10-minute L_{eq} measured at ST-4 was 53 dBA.

ST-5 was made in the northeastern portion of the Plan Area, approximately 25 feet east of the centerline of North 33rd Street, in front of 428 North 33rd Street. Local traffic noise, landscaping, jets, and birds were the noise sources at ST-5. Traffic noise from North 33rd Street generated noise levels of 57 to 63 dBA. A jet flyover generated noise levels of 59 dBA, and birds generated noise levels of 45 to 55 dBA. A distant lawn mower produced noise levels of 50 to 52 dBA, and background traffic noise generated noise levels of 47 to 50 dBA. Additionally, a door slamming during the measurement produced noise levels of 53 dBA. The 10-minute L_{eq} measured at ST-5 was 52 dBA.

ST-6 was made at the corner of North 33rd Street and East St. John Street, approximately 50 and 25 feet from the centerlines of the respective streets. Local traffic noise and aircraft noise were the noise sources at ST-6. Traffic noise from North 33rd Street generated noise levels of 57 to 70 dBA. A jet flyover generated noise levels of 55 dBA, and an airplane generated noise levels of 58 dBA. The 10-minute L_{eq} measured at ST-6 was 57 dBA.

ST-7 was made approximately 50 feet north of the centerline of Alum Rock Avenue. Local traffic noise and jet noise were the noise sources at ST-7. Traffic noise from Alum rock Avenue included heavy trucks (68 to 76 dBA), passenger cars (59 to 72 dBA), and buses (60 to 77 dBA). Jet flyovers generated noise levels of 55 to 61 dBA. The 10-minute L_{eq} measured at ST-7 was 64 dBA.

Previous Noise Monitoring Surveys within the Plan Area

In addition to the noise monitoring survey completed for the proposed project, *Illingworth & Rodkin, Inc.* has previously made ambient noise measurements at the Little Portugal Site in 2019,[3] at the Three Projects in the East Julian Area in 2022,[4] and at the 1271 and 1279 East Julian Street Residential Project in 2023.[5] Each of these projects are approved or planned within the Plan Area.

Little Portugal Gateway

The noise monitoring survey completed at the Little Portugal Gateway project site included two long-term measurements (LT-5 and LT-6) and one short-term measurement (ST-8) and was completed between Tuesday, September 17, 2019 and Friday, September 20, 2019. Figure 3 shows the immediate aerial of the planned project site.

LT-5 was made approximately 45 feet from the centerline of Alum Rock Avenue to represent ambient noise levels at the front of the project site. Hourly average noise levels typically ranged from 65 to 72 dBA L_{eq} during the day and from 58 to 69 dBA L_{eq} at night. The day-night average noise level was 72 dBA DNL on both Wednesday, September 18, 2019, and Thursday, September

[3] Illingworth & Rodkin, Inc., "Little Portugal Gateway Mixed-Use Development Noise and Vibration Assessment," January 16, 2020.

[4] Illingworth & Rodkin, Inc., "Three Projects in the East Julian Area of San José Noise and Vibration Assessment," June 13, 2023.

[5] Illingworth & Rodkin, Inc., "1271 and 1279 East Julian Street Residential Project Noise and Vibration Assessment," September 15, 2023.

19, 2019. The daily trends in noise levels at LT-5 are shown in Figures A13 through A16 of Appendix A.

LT-6 was made approximately 25 feet from the centerline of North 34th Street, to represent the ambient noise environment at residential land uses along the roadway. Vehicular traffic on North 34th Street and Alum Rock Avenue was the primary source of noise affecting ambient noise levels, which typically ranged from 57 to 70 dBA L_{eq} during the day and from 48 to 61 dBA L_{eq} at night. The day-night average noise level on Wednesday, September 18, 2019, was 64 dBA DNL and was 63 dBA DNL on Thursday, September 19, 2019. The daily trends in noise levels at LT-6 are shown in Figures A17 through A20 of Appendix A.

The short-term noise measurement (ST-8) was made at the rear of the Litle Portugal Gateway project site between 2:10 p.m. and 2:20 p.m. on Friday, September 20, 2019. Local traffic was the predominant source of noise at the short-term noise measurement site ST-8. During the measurement, three jet aircraft resulted in noise levels ranging from 54 to 62 dBA. The 10-minute L_{eq} measured at ST-8 was 54 dBA. Table 7 summarizes the data collected at the short-term measurement site.

Three Projects in the East Julian Area

The three project sites included in this project were located at 1325 East Julian Street, 1347 East Julian Street, and 1298 Tripp Avenue. The noise monitoring survey occurred between Tuesday, October 4, 2022, and Thursday, October 6, 2022, and included three long-term measurements (LT-7 and LT-9) and five short-term measurements (ST-9 through ST-13). Figure 4 shows the immediate aerial of these planned project sites.

LT-7 was made approximately 20 feet north of the centerline of Tripp Avenue. Hourly average noise levels at LT-7 typically ranged from 52 to 62 dBA L_{eq} during daytime hours and from 46 to 53 dBA L_{eq} during nighttime hours. The day-night average noise level was 59 dBA DNL on Wednesday, October 5, 2022. The daily trend in noise levels at LT-7 is shown in Figures A21 through A23 of Appendix A.

LT-8 was made along the western boundary of the 1325 East Julian Street site, adjacent to the walking trail and former UPRR tracks. Hourly average noise levels at LT-8 typically ranged from 56 to 65 dBA L_{eq} during daytime hours and from 56 to 60 dBA L_{eq} during nighttime hours. The day-night average noise level was 65 dBA DNL on Wednesday, October 5, 2022. The daily trend in noise levels at LT-8 is shown in Figures A24 through A26 of Appendix A.

LT-9 was made approximately 160 feet north of the centerline of the East Julian Street and approximately 45 feet north of the centerline of the East Julian Street frontage road. Hourly average noise levels at LT-9 typically ranged from 60 to 69 dBA L_{eq} during daytime hours and from 55 to 65 dBA L_{eq} during nighttime hours. The day-night average noise level was 67 dBA DNL on Wednesday, October 5, 2022. The daily trend in noise levels at LT-9 is shown in Figures A27 through A29 of Appendix A.

Short-term noise measurements ST-9 and ST-10 were made on Tuesday, October 4, 2022, between 12:30 p.m. and 1:00 p.m. ST-11 through ST-13 were made on Thursday, October 6, 2022, between

11:30 a.m. and 12:20 p.m. Table 7 summarizes the noise measurement results measured at each site.

ST-9 was made in the northwestern corner of the 1347 East Julian Street site, which is located on the shared boundary with 1325 East Julian Street. The dominant noise source at ST-9 was traffic noise along East Julian Street, the frontage road, and nearby US 101. Traffic along nearby US 101 produced noise levels that ranged from 52 to 53 dBA, while local traffic along East Julian Street produced noise levels that ranged from 52 to 60 dBA. The 10-minute L_{eq} measured at ST-9 was 54 dBA. ST-10 was made along the eastern boundary of 1347 Julian Street at the shared property line with the existing residence to the east. ST-10 was made approximately 170 feet north of the centerline of the East Julian Street frontage road and approximately 65 feet west of the centerline of West Court. Traffic along East Julian Street and nearby US 101 dominated the noise environment at ST-10. Typical local traffic noise levels from East Julian Street ranged from 51 to 61 dBA, while traffic noise levels from nearby US 101 ranged from 51 to 58 dBA. Additional noise contributions from jet flyovers ranged from 57 to 66 dBA at ST-10. The 10-minute L_{eq} measured at ST-10 was 56 dBA.

ST-11 was made in the northwestern corner of the 1298 Tripp Avenue site, approximately 40 feet east of centerline of North 26th Street and approximately 70 feet south of the centerline of Tripp Avenue. Local traffic along North 26th Street dominated the noise environment at ST-11, with noise levels ranging from 53 to 58 dBA. Jet aircraft produced noise levels of 52 dBA at ST-11. The 10-minute L_{eq} measured at ST-11 was 51 dBA. ST-12 was made along the southern boundary of the 1298 Tripp Avenue site. Traffic noise from Tripp Avenue generated noise levels ranging from 48 to 53 dBA at ST-12. Other contributing noise sources included jets (50 to 55 dBA), cars starting and car doors slamming (52 to 58 dBA), human conversation (50 to 58 dBA), and distant music (46 to 49 dBA). The 10-minute L_{eq} measured at ST-12 was 50 dBA. ST-13 was made along the eastern boundary of the 1298 Tripp Avenue site, approximately 15 feet from the centerline of Wooster Avenue. Traffic along Wooster Avenue generated noise levels ranging from 61 to 73 dBA at ST-13. Other contributing noise sources included jets (55 dBA), cars starting and car doors slamming (55 to 58 dBA), auto shop activities (56 dBA), and a helicopter (55 dBA). The 10-minute L_{eq} measured at ST-13 was 59 dBA.

<u>1271 & 1279 East Julian Street</u>

A noise monitoring survey was completed at the 1271 & 1279 East Julian Street project site between Wednesday, March 15, 2023, and Friday, March 17, 2023 and consisted of one long-term (LT-10) and two short-term (ST-14 and ST-15) noise measurements. Figure 4 shows the immediate aerial of this planned project site.

LT-10 was made approximately 60 feet north of the centerline of East Julian Street and approximately 15 feet north of the East Julian Street frontage road. Hourly average noise levels at LT-10 typically ranged from 65 to 74 dBA L_{eq} during daytime hours and from 58 to 68 dBA L_{eq} during nighttime hours. The day-night average noise level during the 24-hour measurement period on Thursday, March 16, 2023, was 71 dBA DNL. The daily trend in noise levels at LT-10 is shown in Figures A30 through A32 of Appendix A.

Short-term noise measurements ST-14 and ST-15 were made on Wednesday, March 15, 2023, between 10:50 a.m. and 11:30 a.m. Table 7 summarizes the noise measurement results measured at each site.

ST-14 was made from the sidewalk east of North 26th Street, approximately 235 feet north of the centerline of East Julian Street. In the absence of local traffic along North 26th Street, ST-14 represents the existing noise levels at the center of the project site. Traffic noise along East Julian Street ranged from 47 to 56 dBA at ST-14. Noise levels from general aviation ranged from 58 to 59 dBA, and jets generated noise levels of 51 to 57 dBA. The 10-minute L_{eq} measured at ST-14 was 51 dBA.

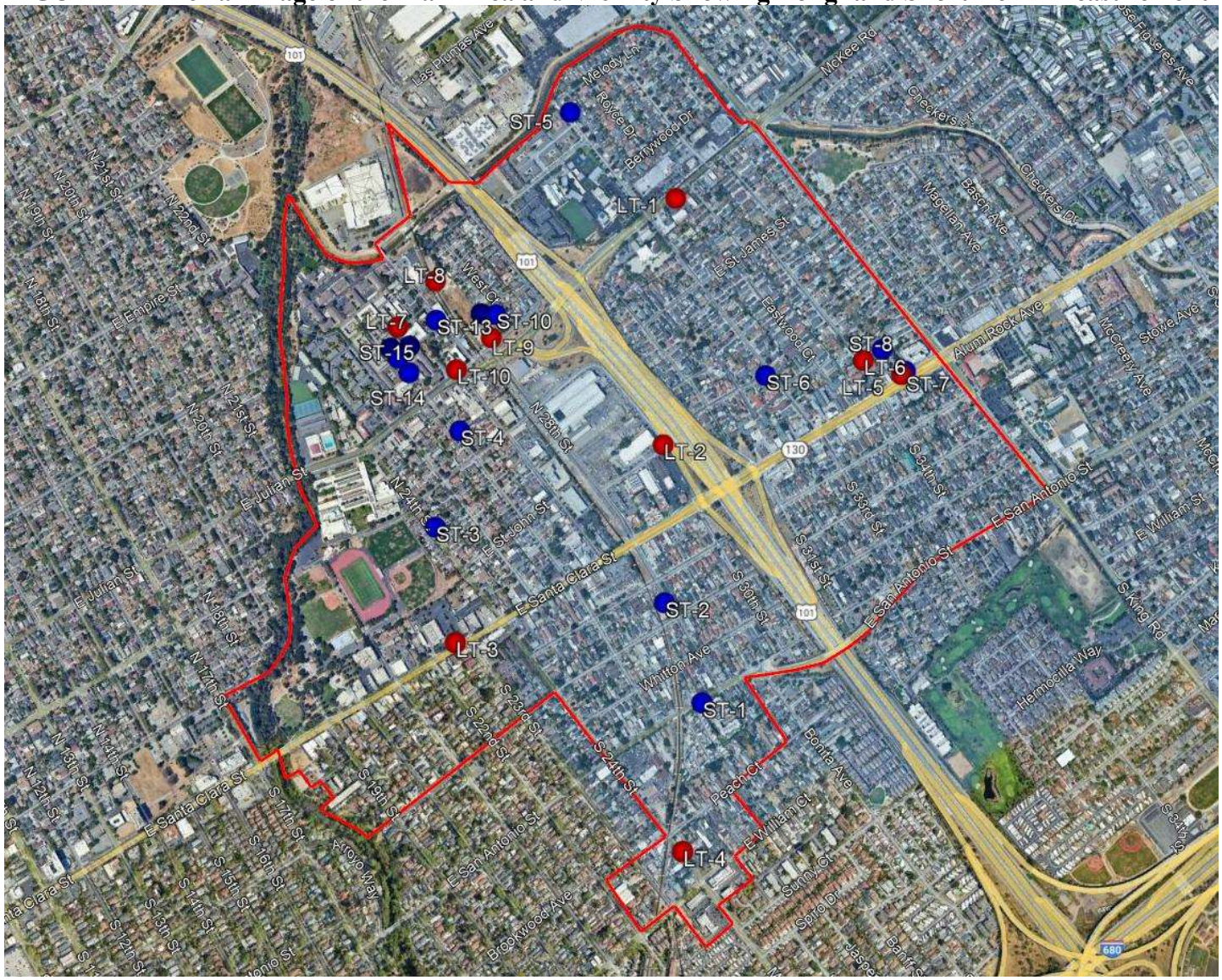
ST-15 was made from the sidewalk east of North 26th Street, approximately 390 feet north of the centerline of East Julian Street. In the absence of local traffic along North 26th Street, ST-15 represents the existing noise levels at the rear of the project site. Traffic noise along East Julian Street ranged from 46 to 50 dBA at ST-15. Other observed noise sources at ST-2 included jets (49 to 52 dBA), distant car doors shutting (51 dBA), birds chirping (50 to 59 dBA), and a distant leaf blower (48 dBA). The 10-minute L_{eq} measured at ST-15 was 49 dBA.

TABLE 7 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	Date, Time	Measured Noise Level, dBA					
		L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: ~35 feet from the centerline of East San Antonio Street	5/15/2024, 10:30-10:40	75	70	63	55	50	60
ST-2: ~30 feet from the centerline of South 28th Street	5/15/2024, 10:50-11:00	69	67	63	54	50	58
ST-3: ~25 feet from the centerline of North 24th Street	5/15/2024, 11:10-11:20	72	70	64	50	45	59
ST-4: ~25 feet from the centerline of North 26th Street	5/15/2024, 11:30-11:40	64	63	56	48	45	53
ST-5: ~25 feet from the centerline of North 33rd Street	5/15/2024, 11:50-12:00	63	60	55	51	47	52
ST-6: corner of North 33rd Street and East St. John Street	5/15/2024, 12:10-12:20	71	67	61	51	49	57
ST-7: ~50 feet from the centerline of Alum Rock Avenue	5/15/2024, 12:30-12:40	77	73	69	60	52	64
ST-8: ~300 feet from the centerline of Alum Rock Avenue	9/20/2019, 14:10-14:20	63	61	57	53	49	54

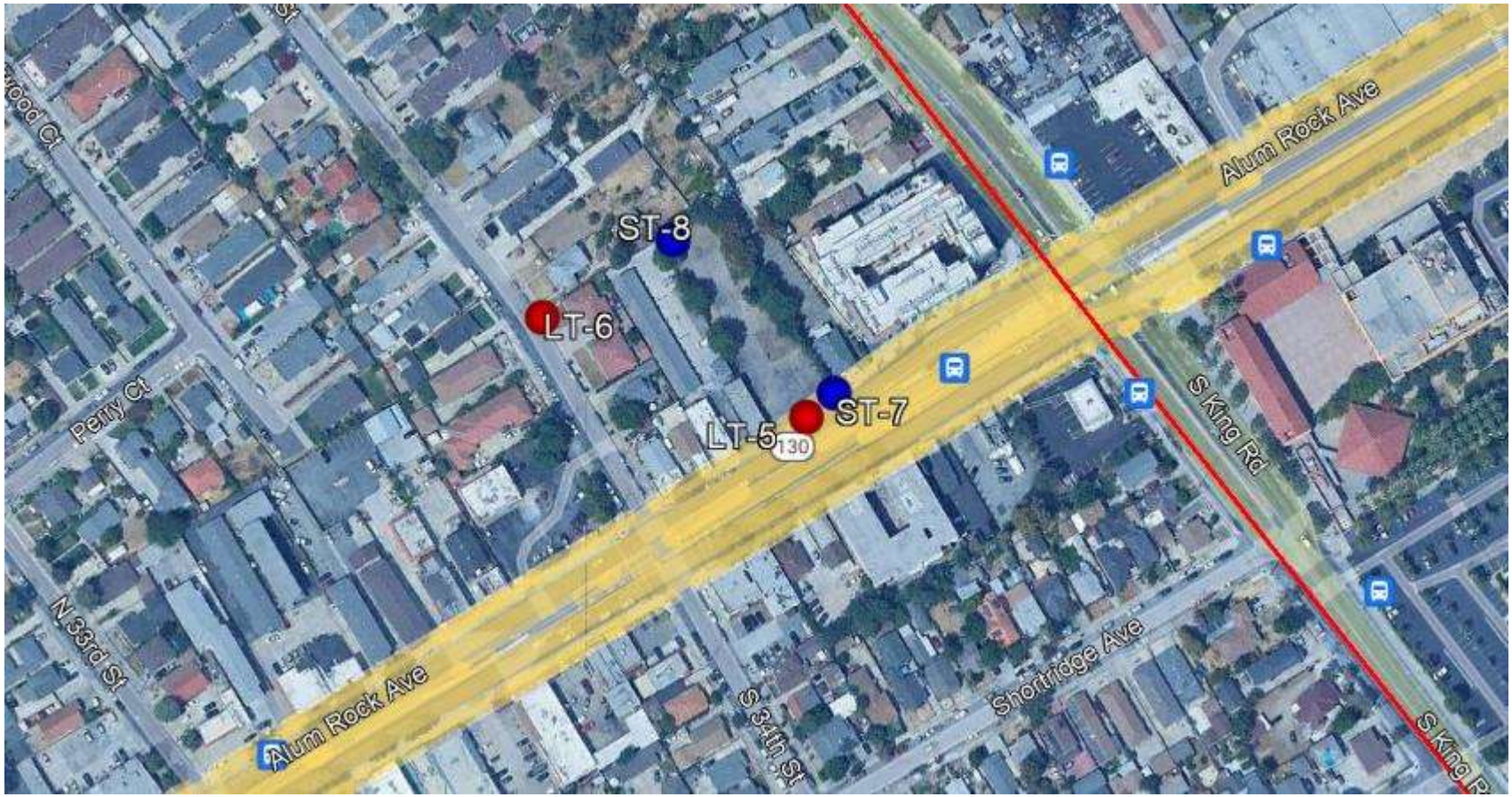
Noise Measurement Location	Date, Time	Measured Noise Level, dBA					
		L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-9: northwestern corner of the 1347 East Julian Street site	10/4/2022, 12:30-12:40	60	59	56	54	52	54
ST-10: ~170 feet from the centerline of the East Julian Street frontage road and ~65 feet from the centerline of West Court	10/4/2022, 12:50-13:00	66	63	57	55	53	56
ST-11: ~40 feet from the centerline of North 26th Street and ~70 feet from the centerline of Tripp Avenue	10/6/2022, 11:30-11:40	69	60	54	45	44	51
ST-2: southern boundary of the 1298 Tripp Avenue site	10/6/2022, 11:50-12:00	60	56	53	49	47	50
ST-13: ~15 feet from the centerline of Wooster Avenue	10/6/2022, 12:10-12:20	73	70	62	55	50	59
ST-14: represents existing noise environment at the center of the project site	3/15/2023, 10:50-11:00	59	57	54	51	49	51
ST-15: represents existing noise environment at the rear of the project site	3/15/2023, 11:20-11:30	59	56	50	48	47	49

FIGURE 2 Aerial Image of the Plan Area and Vicinity Showing Long- and Short-Term Measurement Locations



Source: Google Earth, 2024.

FIGURE 3 Aerial Image of the Little Portugal Gateway Project Site and Vicinity Showing Long- and Short-Term Measurement Locations



Source: Google Earth, 2024.

FIGURE 4 Aerial Image of the Three Projects in the East Julian Area and 1271 & 1279 East Julian Street and Vicinity Showing Long- and Short-Term Measurement Locations



Source: Google Earth, 2024.

Existing and Future Noise Scenarios

The FHWA 77-108 Traffic Noise Calculator was used to calculate traffic noise levels along major roadways, expressways, and highways in the Plan Area. Average daily traffic (ADT) volumes for the Existing 2015, 2040 General Plan, and 2040 General Plan Plus Project scenarios were provided by *Hexagon Transportation Consultants, Inc.* Observed vehicle mix data, posted speed limits, roadway widths, and the numbers of travel lanes were also input into the calculation model. For US 101, truck mix data input into the calculation model was based on information published by the California Department of Transportation (Caltrans). The predicted noise levels were then compared to measured noise levels for calibration purposes and adjustments were made as necessary to the model.

Table 8 summarizes the existing and future DNL noise levels at 75 feet from the centerline of the roadway. US 101 was modeled directionally, and the noise level was measured 75 feet from each direction of travel.

The UPRR corridor transects the east and west areas of the Plan Area. However, these tracks are not currently in use and are not planned to resume usage in the future. As part of the *Valley Transportation Authority's (VTA's) Bay Area Rapid Transit (BART) Silicon Valley Phase II Extension Project* (Phase II Extension Project),[6] BART tracks would be extended from the Berryessa/North San José Station to the Santa Clara Station in the City of Santa Clara (see Figure 5). As shown in Figure 5, a part of this extension would travel through the Plan Area, with a new station identified as the 28th Street/Little Portugal Station. This portion of BART would be an underground subway. The noise section of the Phase II Extension Project states that train noise from subway tunnels can be transmitted to the surface via ventilation shafts; however, the nearest ventilation facility identified in the study would be located at Santa Clara Street and 13th Street, which would be to the west of the Plan Area. Traction Power Substations were also identified as a noise source when located near residences, but these substations would not be located within the Plan Area. The 28th Street/Little Portugal Station would have an emergency backup generator, which would generate noise. According to the Phase II Extension Project, the generator would be expected to be quieter than existing generators on the BART system and are typically located within enclosures that further reduce noise levels. The generator would be located at grade, within a concrete structure. Noise levels from the generator could exceed 55 dBA at nearby sensitive receptors; however, implementation of Mitigation Measure NV-A would result in no adverse effect. Mitigation Measure NV-A is as follows:

> **Mitigation Measure NV-A: Implement noise reduction treatments at ancillary facilities**
>
> Noise reduction treatments will be implemented at ancillary facilities such as tunnel ventilation shafts, pressure relief shafts, traction power substations, and emergency backup generators such that noise levels comply with applicable Cities of San Jose and Santa Clara

[6] U.S. Department of Transportation Federal Transit Administration and Santa Clara Valley Transportation Authority, "VTA's BART Silicon Valley Phase II Extension Project Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report and Draft Section 4(f) Evaluation Volume I," February 2018.

noise criteria at nearby developed land uses. Treatments that will be implemented, if necessary, include but are not limited to:

- Sound attenuators and acoustical absorptive treatments in ventilation shafts and facilities.

- Sound attenuators for the tunnel emergency ventilation fans.

- Perimeter noise walls (nominally an 8 feet high wall) placed around emergency generators.

It is assumed that this mitigation measure would be incorporated into the future station, and noise levels from the station and BART train would not exceed 55 dBA in the Plan Area. Additionally, groundborne noise could not exceed FTA noise level thresholds at sensitive receptors in the Plan Area with the implementation of Mitigation Measure NV-B, which states the following:

Mitigation Measure NV-B: Reduce groundborne noise levels

The mitigation strategy for groundborne noise is an Isolated Slab Track (IST), An IST is a form of floating slab track (FST). The IST system is constructed with a continuous elastomeric mat instead of discrete elastomeric pads that are typically used for an FST system. An IST can be designed to provide from 10 to 13 dBA of noise reduction. Mitigation Measure NV-B can also be used under a crossover. The locations for implementing this mitigation are shown in Tables 4.12-21 through 4.12-25. The specific mitigation strategy will be determined in final design and could include alternative strategies that similarly achieve the FTA groundborne noise criteria.

The San José Mineta International Airport (SJC) is located approximately 2.2 miles northwest of the Plan Area. According to the City of San José's Airport Master Plan Environmental Impact Report,[7] the Plan Area lies well outside the 60 dBA CNEL/DNL contour line, as shown in Figure 6. Residential and nonresidential land uses proposed in the Plan Area would be compatible with the future operations of the airport.

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

TABLE 8 Existing and Future Estimated Noise Levels Along Surrounding Roadways

Roadway	Segment	DNL at 75 feet from the Roadway Centerline, dBA			Increase Over Existing, dBA		Increase of 2040 Plus Project Over 2040 No Project, dBA
		Existing	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	
Julian Street/ McKee Road	East of King Road	68	70	70	2	2	0
	King Road to 33rd Street	69	70	70	1	1	0
	33rd Street to US 101 northbound ramps	69	71	71	2	2	0
	US 101 southbound ramps to 28th Street	65[a]	68[a]	69[a]	3[a]	4[a]	1[a]
	28th Street to 24th Street	64	67	67	**3**	**3**	0
	West of 24th Street	63	65	65	2	2	0
Santa Clara Street/ Alum Rock Road	East of King Road	63	64	64	1	1	0
	King Road to 34th Street	64	64	64	0	0	0
	34th Street to US 101 northbound ramps	64	63	63	-1	-1	0
	US 101 southbound ramps to 28th Street	64	63	64	-1	0	0
	28th Street to 24th Street	63	62	62	-1	-1	0
	24th Street to 21st Street	64	63	63	-1	-1	0
	21st Street to 19th Street	64	63	63	-1	-1	0
	19th Street to 17th Street	64	63	64	-1	0	0
	West of 17th Street	64	63	63	-1	-1	0
San Antonio Street	East of King Road	55	58	57	3[b]	2	-1
	King Road to 33rd Street	55	60	60	**5**	**5**	0
	33rd Street to 28th Street	56[a]	59[a]	60[a]	3[a,b]	4[a]	1[a]
	28th Street to 24th Street	58	59	59	1	1	0

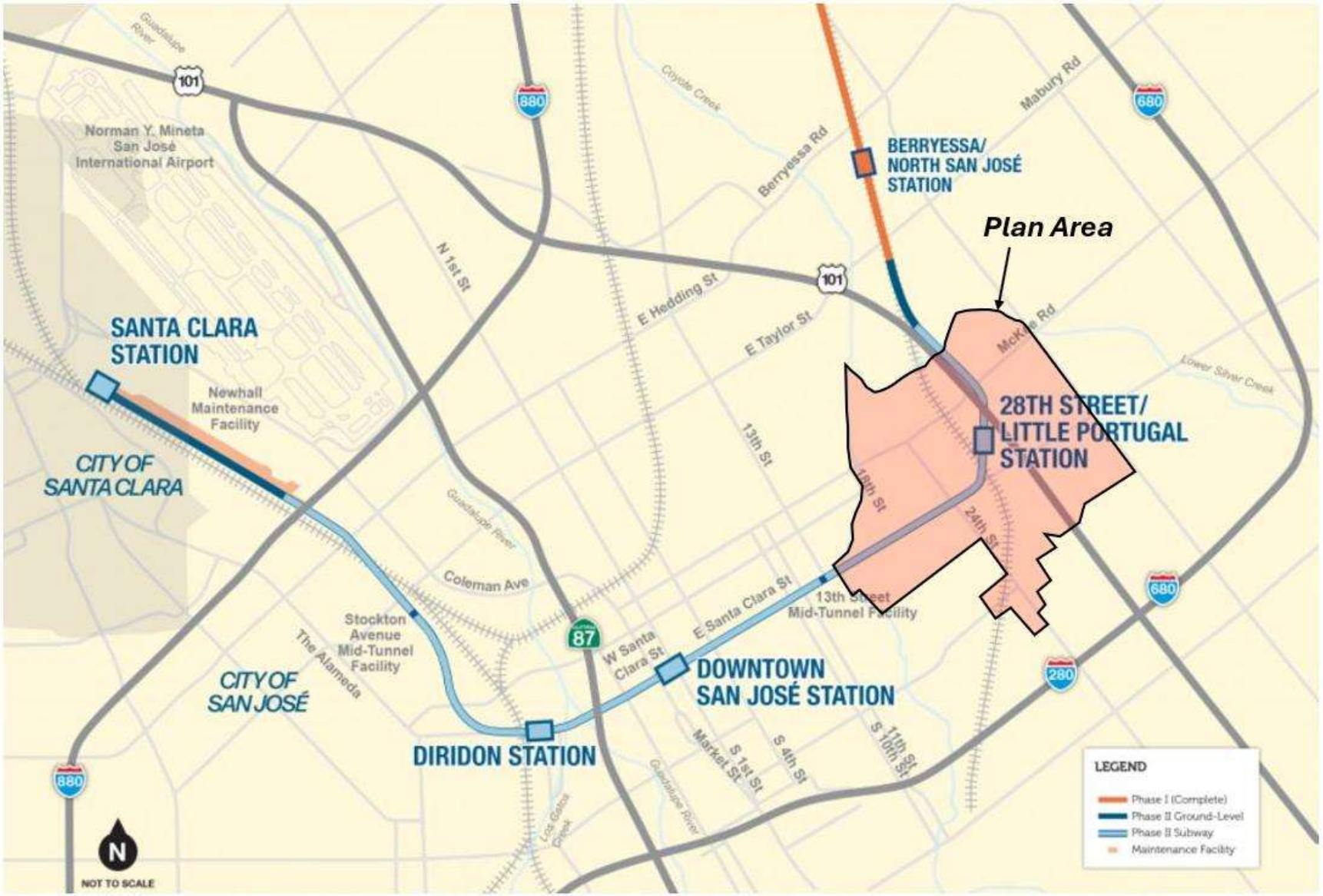
Roadway	Segment	DNL at 75 feet from the Roadway Centerline, dBA			Increase Over Existing, dBA		Increase of 2040 Plus Project Over 2040 No Project, dBA
		Existing	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	
	West of 24th Street	56	59	59	3[b]	3[b]	0
King Road	North of Julian Street/ McKee Road	66	68	68	2	2	0
	Julian Street/McKee Road to St James Street	65	68	68	**3**	**3**	0
	St James Street to Santa Clara Street/ Alum Rock Avenue	66	68	68	2	2	0
	Santa Clara Street/ Alum Rock Avenue to San Antonio Street	66	69	69	**3**	**3**	0
	South of San Antonio Street	66	68	68	2	2	0
28th Street	Julian Street/McKee Road to St James Street	N/A[b]	54	55	N/A[c]	N/A[c]	N/A[c]
	St James Street to Santa Clara Street/ Alum Rock Avenue	N/A[b]	59	59	N/A[c]	N/A[c]	N/A[c]
24th Street	Julian Street/McKee Road to St James Street	59	62	62	**3**	**3**	0
	St James Street to Santa Clara Street/ Alum Rock Avenue	58	61	61	**3**	**3**	0
	Santa Clara Street/ Alum Rock Avenue to San Fernando Street	61	61	61	0	0	0
	San Fernando Street to San Antonio Street	60	61	61	1	1	0
	South of San Antonio Street	58	59	59	1	1	0

Roadway	Segment	DNL at 75 feet from the Roadway Centerline, dBA			Increase Over Existing, dBA		Increase of 2040 Plus Project Over 2040 No Project, dBA
		Existing	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	
19th Street	Santa Clara Street/ Alum Rock Avenue to San Fernando Street	51	54	55	3[b]	4[b]	1
	South of San Fernando Street	52	53	54	1	2	1
17th Street	North of Santa Clara Street/ Alum Rock Avenue	60	60	61	0	1	1
	South of Santa Clara Street/ Alum Rock Avenue	52	58	58	**6[b]**	**6[b]**	0
US 101 northbound on ramp	At Julian Street/ McKee Road	69	71	71	2	2	0
	At Santa Clara Street/ Alum Rock Avenue	67	67	67	0	0	0
US 101 northbound off ramp	At Julian Street/ McKee Road	68	69	69	1	1	0
	At Santa Clara Street/ Alum Rock Avenue	69	69	70	0	1	1
US 101 southbound on ramp	At Julian Street/ McKee Road	67	69	69	2	2	0
	At Santa Clara Street/ Alum Rock Avenue	69	70	70	1	1	0
US 101 southbound off ramp	At Julian Street/ McKee Road	67	68	68	1	1	0
	At Santa Clara Street/ Alum Rock Avenue	65	65	65	0	0	0
US 101 northbound	South of Santa Clara Street/Alum Rock Avenue	80	80	81	0	1	1
	Santa Clara Street/Alum Rock Avenue to Julian Street/McKee Road	81	81	81	0	0	0

Roadway	Segment	DNL at 75 feet from the Roadway Centerline, dBA			Increase Over Existing, dBA		Increase of 2040 Plus Project Over 2040 No Project, dBA
		Existing	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	2040 General Plan Buildout	2040 General Plan Buildout Plus Project	
	North of Julian Street/McKee Road	80	80	80	0	0	0
US 101 southbound	North of Julian Street/McKee Road	80	80	80	0	0	0
	Julian Street/McKee Road to Santa Clara Street/Alum Rock Avenue	81	81	81	0	0	0
	South of Santa Clara Street/Alum Rock Avenue	80	80	80	0	0	0

[a] Calculated noise levels were estimated solely based on traffic along these roadway segment; however, due to the location of these segments being in close proximity to US 101, existing and future noise levels at these locations would be dominated by US 101. Existing and future noise levels would be 80 to 81 dBA DNL at these locations, which would result in a 0 dBA DNL increase under 2040 General Plan Buildout conditions, with and without the proposed Plan.
[b] Since the future noise levels would remain below the normally acceptable threshold of 60 dBA DNL, a significant permanent noise level increase would be 5 dBA DNL or more for these segments.
[c] Existing traffic volumes were not provided along 28th Street. Therefore, noise level increases could not be calculated.

FIGURE 5 Planned Alignment of VTA BART Extension



Source: https://www.vta.org/projects/bart-sv/phase-ii.

FIGURE 6 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

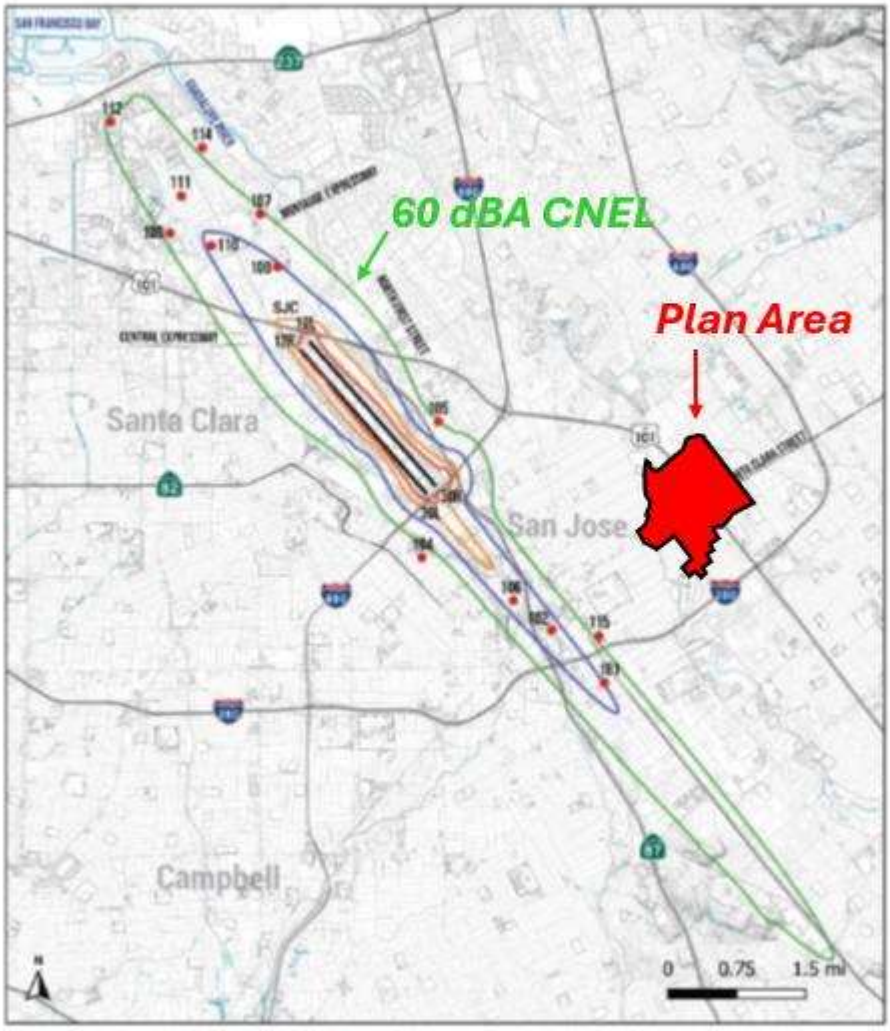


Figure 5 Scenario 2: With Project 2037 Noise Contour Map

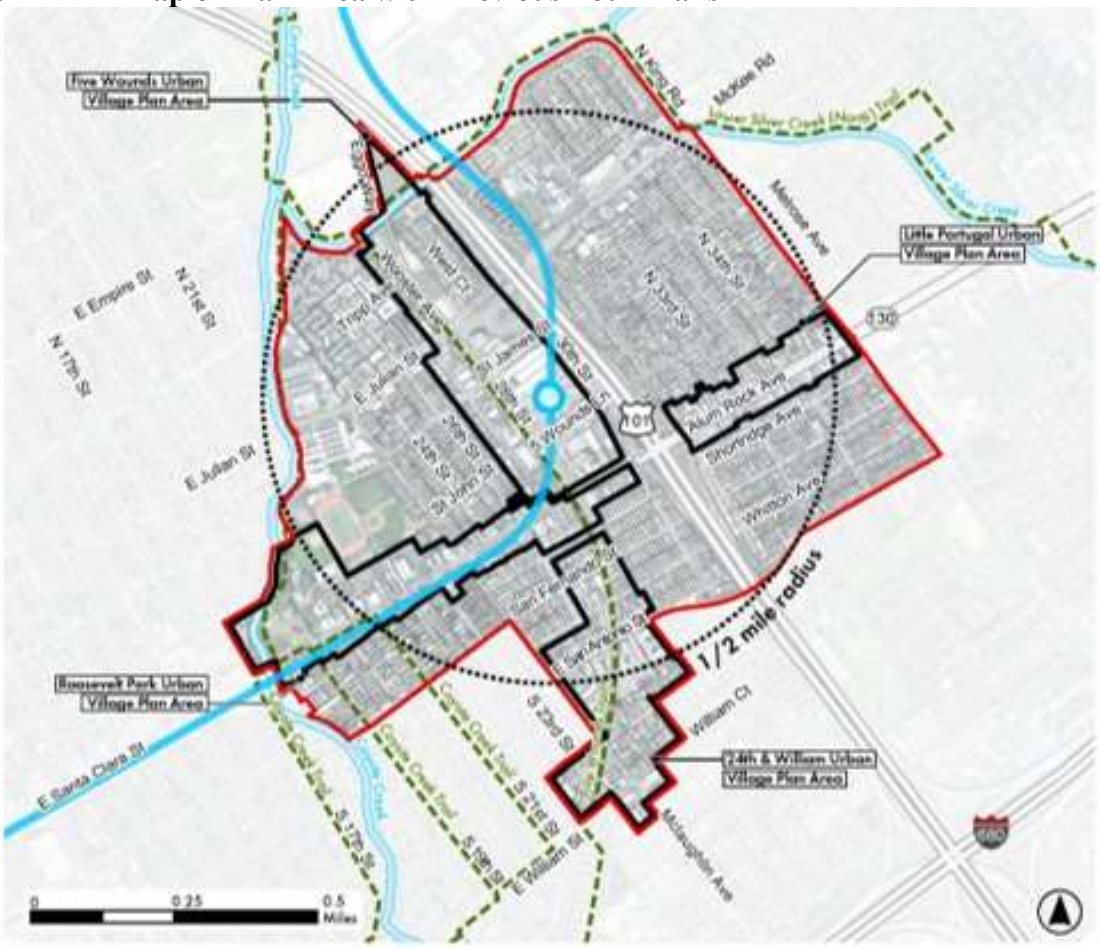
Source: BridgeNet International 2019

PLAN CONSISTENCY ANALYSIS

The Project implements the Envision San José 2040 General Plan by creating an Urban Village as set forth by Major Strategy #5 in the General Plan, with the goal to consolidate four existing Urban Village Plans into a new singular Urban Village using the previous four plans as a basis for districts within the new Plan. Figure 7 shows the Plan Area and identifies the previous four plans. The new Five Wounds Urban Village Plan proposes to modify the total aggregate of housing and jobs capacities in the existing four Urban Village Plans from 4,855 jobs and 2,022 housing units to 2,000 jobs and 6,000 units.

This section summarizes the analysis of the land use compatibility of the proposed development within the Plan Area with respect to the future noise environment. Recommendations are made to ensure that future developments within the Plan Area are not exposed to excessive noise levels.

FIGURE 7 Map of Plan Area with Previous Four Plans



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. Policy

EC-1.1 and Table EC-1 of the General Plan defines the noise level standards required for noise and land compatibility studies. The policy states the following:

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.

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

Noise level thresholds included in Table EC-1 and Policy EC-1.1 requires future projects proposed within the Plan Area to meet the following noise levels:

- The City's acceptable exterior noise level standard is 60 dBA DNL or less for all single- and multi-family residential land uses. This threshold would apply to hotels/motels, as well.

- The City's acceptable exterior noise level standard is 70 dBA DNL or less for all office buildings, business, commercial and professional land uses.

- The City's standard for interior noise at the proposed residential land uses is 45 dBA DNL.

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

Noise levels in the Plan Area were measured and calculated using the 75-foot receptor noise levels in Table 8. The estimated noise level increases along each roadway segment are also summarized in Table 8.

Future Exterior Noise Environment

Specific locations for future development projects are unknown at this time. However, distances to the 60, 65, and 70 dBA DNL thresholds for each proposed uses were estimated along each roadway segment based on the future exterior noise levels summarized in Table 9.

Noise produced by vehicular traffic along roadways in the vicinity of Plan Area could potentially expose the proposed land uses to levels exceeding the exterior compatibility thresholds. Future exterior noise levels at a distance of 75 feet from the centerline of the primary roadways within the Plan Area would typically range from 54 dBA DNL along 19th Street south of San Fernando Street to 71 dBA DNL along Julian Street/McKee Road between 33rd Street and the US 101 northbound ramps. Future exterior noise levels within 75 feet from US 101 would range from 80 to 81 dBA DNL. Table 9 summarizes the distances to the 60, 65, and 70 dBA DNL noise contours along the roadways within the Plan Area.

TABLE 9 2040 General Plan Buildout Plus Proposed Project Traffic Noise Contour Distances within the Plan Area

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA DNL	65 dBA DNL	60 dBA DNL
Julian Street/ McKee Road	East of King Road	80	170	365
	King Road to 33rd Street	75	155	335
	33rd Street to US 101 northbound ramps	85	180	390
	US 101 southbound ramps to 28th Street	65	130	285
	28th Street to 24th Street	50	105	225
	West of 24th Street	35	70	150
Santa Clara Street/ Alum Rock Road	East of King Road	30	65	140
	King Road to 34th Street	30	65	135

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA DNL	65 dBA DNL	60 dBA DNL
	34th Street to US 101 northbound ramps	30	60	130
	US 101 southbound ramps to 28th Street	30	60	130
	28th Street to 24th Street	25	50	105
	24th Street to 21st Street	25	55	115
	21st Street to 19th Street	30	55	120
	19th Street to 17th Street	30	60	130
	West of 17th Street	25	55	115
San Antonio Street	East of King Road	15	25	50
	King Road to 33rd Street	15	35	70
	33rd Street to 28th Street	15	35	75
	28th Street to 24th Street	15	35	70
	West of 24th Street	15	30	65
King Road	North of Julian Street/ McKee Road	55	115	250
	Julian Street/McKee Road to St James Street	55	120	260
	St James Street to Santa Clara Street/ Alum Rock Avenue	60	125	265
	Santa Clara Street/ Alum Rock Avenue to San Antonio Street	65	130	285
	South of San Antonio Street	60	125	270
28th Street	Julian Street/McKee Road to St James Street	10	15	35
	St James Street to Santa Clara Street/ Alum Rock Avenue	15	30	65
24th Street	Julian Street/McKee Road to St James Street	25	50	105

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA DNL	65 dBA DNL	60 dBA DNL
	St James Street to Santa Clara Street/ Alum Rock Avenue	20	45	90
	Santa Clara Street/ Alum Rock Avenue to San Fernando Street	20	45	95
	San Fernando Street to San Antonio Street	20	45	90
	South of San Antonio Street	15	35	70
19th Street	Santa Clara Street/ Alum Rock Avenue to San Fernando Street	10	15	35
	South of San Fernando Street	10	15	30
17th Street	North of Santa Clara Street/ Alum Rock Avenue	20	40	85
	South of Santa Clara Street/ Alum Rock Avenue	15	25	55
US 101 northbound	South of Santa Clara Street/Alum Rock Avenue	380	815	1,750
	Santa Clara Street/Alum Rock Avenue to Julian Street/McKee Road	425	910	1,955
	North of Julian Street/McKee Road	350	750	1,615
US 101 southbound	North of Julian Street/McKee Road	355	765	1,650
	Julian Street/McKee Road to Santa Clara Street/Alum Rock Avenue	415	895	1,925
	South of Santa Clara Street/Alum Rock Avenue	375	800	1,725

Future Interior Noise Environment

Residential Uses

Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. 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.

The setback distances in Table 9 to meet the exterior noise limit of 60 dBA DNL would also meet the interior noise limit of 45 dBA DNL, assuming standard residential construction materials. Buildings within the setback distances to the 65 dBA DNL contour would require adequate forced-air mechanical ventilation with standard construction materials to meet 45 dBA DNL within residential units. At or within the 70 dBA DNL contour distance, sound-rated construction materials would be required to meet the 45 dBA DNL limit.

Commercial, Office, and Industrial Uses

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

Spaces where lower noise levels would be desired, such as private offices and conference rooms, 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 or greater along exterior façades).

Recommendations to Reduce Future Exterior and Interior Noise Levels

Incorporation of Policies EC-1.1, EC-1.9, EC-1.11, and EC-1.14, in conjunction with the Land Use Compatibility Guidelines, would require that the General Plan compatibility standards be used to determine where noise levels in the community are acceptable or unacceptable, and require noise attenuation measures to achieve the "normally acceptable" noise standards. Noise studies of new development proposals are required when existing or future noise levels from transportation or non-transportation noise sources exceed the "acceptable" levels for that use in order to determine the controls necessary to maintain consistency with the interior and exterior noise standards of the Noise Element. The interior noise limits set forth in the State Building Code are extended to residential, hotel, motel, residential care, and hospital land uses in San José. General Plan Policy EC-1.9 would be implemented and would require that studies be conducted to mitigate

loud intermittent noise sources such as aircraft. Policy EC-1.11 would be implemented and would require that incompatible land uses be located outside of the 65 dBA CNEL noise contour.

Train Vibration and Land Use Compatibility

The U.S. Department of Transportation, Federal Transit Administration's (FTA) vibration impact assessment criteria[8] are used by the City of San José to evaluate the compatibility of proposed projects with vibration levels produced by heavy-rail and light-rail trains. The FTA vibration impact criteria are based on maximum overall levels for a single event. The impact criteria for groundborne vibration are shown in Table 6. Note that there are criteria for frequent events (more than 70 events of the same source per day), occasional events (30 to 70 vibration events of the same source per day), and infrequent events (less than 30 vibration events of the same source per day).

The former UPRR are not currently in use and are not expected to be in use in the future. However, a future underground BART tunnel is planned to go through the Plan Area (see Figure 5). According to the Phase II Extension Project,[7] no vibration impacts are projected for the tunnel alignment when the predicted levels of vibration are compared to the FTA 1/3-octave band criteria. Therefore, the FTA vibration thresholds are not expected to be exceeded at any receptors in the Plan Area. All projects within the Plan Area would be compatible with the future vibration environment.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

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

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

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

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

Impact 1a: **Temporary Construction Noise.** Construction noise would cause a temporary or periodic increase in noise exposure above ambient noise levels.

[8]U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.

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.

Major noise-generating construction activities associated with new projects would include removal of existing pavement and structures, site grading and excavation, installation of utilities, the construction of building foundations, cores, and shells, paving, and landscaping. The highest noise levels would be generated during the demolition of existing structures when impact tools are used (e.g., jackhammers, hoe rams) and during the construction of building foundations when impact pile driving is required to support the structure. Site grading and excavation activities would also generate high noise levels as these phases often require the simultaneous use of multiple pieces of heavy equipment such as dozers, excavators, scrapers, and loaders. Lower noise levels result from building construction activities when these activities move indoors, and less heavy equipment is required to complete the tasks. Construction equipment would typically include, but would not be limited to, earth-moving equipment and trucks, pile driving rigs, mobile cranes, compressors, pumps, generators, paving equipment, and pneumatic, hydraulic, and electric tools. Table 10 shows the maximum noise level ranges for different construction equipment. Table 11 presents the typical range of hourly average noise levels generated by distinct phases of construction measured at 50 feet from a busy construction site.

Typical hourly average construction-generated noise levels are about 77 to 89 dBA L_{eq} measured at 50 feet from the site during busy construction periods. Large pieces of earth-moving equipment, such as graders, scrapers, and dozers, generate maximum noise levels of 85 to 90 dBA L_{max} at 50 feet. During each stage of construction, there would be a different mix of equipment operating and noise levels would vary based on the amount of equipment on site and the location of the activity. Construction noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. Intervening structures or terrain would result in lower noise levels at distant receivers.

The City of San José does not establish quantitative noise limits for demolition or construction activities occurring in the City. According to San José's Municipal Code, the legal hours of construction within 500 feet of a residential unit are limited to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday.

Noise generated by small infill projects facilitated by the plan would likely have relatively short overall construction durations, with the noisiest phases of construction (e.g., demolition, foundations, project infrastructure, building core and shell), limited to a timeframe of one year or less. These phases of construction are not anticipated to generate noise levels in excess 5 dBA above the ambient noise environment at sensitive land uses in the area over extended periods of time (beyond one construction season). Interior construction, landscaping, and finishing activities would not be expected to result in noise levels in excess of the ambient noise environment. Large construction projects facilitated by the plan may result in a substantial temporary noise increase at noise-sensitive land uses adjoining project sites within the Plan Area.

TABLE 10 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.

Source: Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, National Cooperative Highway Research Program, 1999.

TABLE 11 Typical Ranges of Noise Levels at 50 Feet from Construction Sites (dBA L_{eq})

	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: United States Environmental Protection Agency, 1973, Legal Compilation on Noise, Vol. 1, p. 2-104.

The potential short-term noise impacts associated with construction facilitated by the Five Wounds Urban Village Plan Area would be mitigated by 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.

Pursuant to this policy, the City of San José considers temporary construction impacts to be potentially significant if:

- Construction occurs within 500 feet of residential uses or within 200 feet of commercial or office uses;
- Total construction duration lasts for more than one year; and

- Construction includes substantial noise-generating activities, such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing.

Construction Projects of Less Than One Year

The City considers temporary construction impacts to be less-than-significant if total construction duration is less than one year, if the project complies with the City's allowable construction hours within 500 feet of residential uses, and if the project adheres to the City's Standard Permit Conditions for Construction-Related Noise. These measures shall be incorporated into all construction projects within the Plan Area. The measures include, but are not limited to, the following:

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

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

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

- Prohibit unnecessary idling of internal combustion engines.

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

- Utilize "quiet" air compressors and other stationary noise sources where technology exists.

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

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

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

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

Construction Projects of More Than One Year

The City considers any temporary construction project lasting more than one year to be significant if the project site lies within 500 feet of existing residential uses or within 200 feet of existing commercial or office uses and if the project involves substantial noise-generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing). This would be a potentially significant impact.

Mitigation Measure 1a:

Pursuant to General Plan Policy EC-1.7, all large or complex construction projects must submit a construction noise logistics plan prepared by a qualified acoustical consultant and submitted prior to approval of any construction-related permits. All construction noise logistics plans would include the City's Standard Permit Conditions for Construction-Related Noise listed above. Additional measures shall include, but not be limited to, the following:

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

- 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).

- If impact pile driving is proposed, multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced.

- If impact pile driving is proposed, temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected.

- If impact pile driving is proposed, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows

required to seat the pile. Notify all adjacent land uses of the construction schedule in writing.

- Prior to issuance of any demolition or grading permits, the project applicant shall submit a copy of the noise logistics plan to the Director of Planning, Building and Code Enforcement or the Director's designee.

The potential short-term noise impacts associated with construction facilitated by the projects would be mitigated by the implementation Mitigation Measure 1a, described above, that requires reasonable noise reduction measures be incorporated into the construction plan and implemented during all phases of construction activity to minimize the exposure of neighboring properties and reduce temporary construction noise levels to meet the FTA's thresholds. Policy EC-1.7 in combination with the limitations on hours set forth in the Municipal Code, would reduce the impact to a less-than-significant level.

Impact 1b: **Permanent Noise Level Increase/Exceed Applicable Standards.** New noise-generating land uses or the siting of new sensitive receptors could result in noise levels that would exceed the City's noise thresholds of acceptability at sensitive receivers in the vicinity. Traffic volumes generated by the development within the Plan Area would result in a 3 dBA or more increase along several roadways.

Increases in traffic noise gradually degrade the environment in areas sensitive to noise. According to CEQA, "a substantial increase" is necessary to cause a significant environmental impact.

Policy EC-1.2 of the City's General Plan defines a significant increase if a project:

- Causes the DNL at noise-sensitive receptors in Categories 1, 2, 3, and 6 of Table EC-1 to increase by 5 dBA DNL or more where the noise levels would remain "normally acceptable;" or

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

Policies EC-1.3 and EC-1.6 provide noise level limitations for new nonresidential developments. Policy EC-1.3 requires new nonresidential developments to mitigate project-generated noise levels to 55 dBA DNL at the receiving property lines of residential and public/quasi-public receptors. Policy EC-1.6 limits noise levels generated by existing and new industrial and commercial developments at adjacent uses to noise standards provided in the City's Municipal Code. Noise generated by new nonresidential developments would be limited to 55 dBA DNL at receiving residential property lines, to 60 dBA DNL at receiving commercial property lines, and to 70 dBA DNL at receiving industrial use property lines.

Project-Generated Traffic

Traffic noise levels were calculated for the year 2040, with and without the Project, and compared to existing conditions to quantify the noise level increase attributable to the development facilitated

by the Five Wounds Urban Village Plan. Table 8 shows the estimated noise levels along roadway segments included in the traffic study for the proposed Plan Area. Noise levels would increase substantially (i.e., by 3 dBA DNL or more where future noise levels are 60 dBA DNL or above or by 5 dBA DNL or more where future noise levels are below 60 dBA DNL, as indicated by bold font) along the following segments:

- Julian Street/McKee Road between 28th Street and 24th Street
- San Antonio Street between King Road and 33rd Street
- King Road between Julian Street/McKee Road and St James Street
- King Road between Santa Clara Street/Alum Rock Avenue and San Antonio Street
- 24th Street between Julian Street/McKee Road and St James Street
- 24th Street between St James Street and Santa Clara Street/Alum Rock Avenue
- 17th Street south of Santa Clara Street/Alum Rock Avenue

Each of these segments resulted in the same significant noise level increase under the Existing 2040 General Plan Buildout, with and without the project. Other segments shown in Table 8, including Julian Street/McKee Road between US 101 southbound ramps and 28th Street and San Antonio Street between 33rd Street and 28th Street, indicate a significant noise level increase under the future project conditions; however, these segments are located adjacent to US 101, and the noise environment along these segments would be dominated by the highway, not the local roadways. When compared to the noise levels generated by US 101 (i.e., 80 to 81 dBA DNL), traffic noise along these segments would be insignificant. Therefore, the traffic increase along the local roadways would not contribute to the future noise environment at project sites in the vicinity and would not be treated as a significant permanent noise level increase within the Plan Area.

Noise levels along US 101 are expected to increase up to 1 dBA DNL. Comparing the noise level increases under future cumulative 2040 General Plan Buildout scenario to the noise level increases under the 2040 General Plan Buildout Plus Project scenario, the project's contribution would be 1 dBA DNL or less.

The Existing 2040 General Plan build-out was found to result in a significant and unavoidable impact with regard to permanent noise increases due to traffic. In order to reduce the impact to the extent feasible, General Plan Policy EC-1.4 was recommended to include appropriate noise attenuation techniques in the design of new arterial streets projected to adversely impact noise sensitive uses. A combination of mitigation measures, such as the repaving of area roadways with a "quiet pavement," replacement or construction of noise barriers, traffic calming measures, and sound insulation could be implemented to reduce the effects of increased traffic noise generated by development under the proposed General Plan. However, traffic generated by the Five Wounds Urban Village Plan would not measurably contribute to impact on a cumulative basis. This is a less-than-significant impact.

Operational Noise

Under the Envision San José 2040 General Plan, the Village land use designation includes proposed mixed-use residential development throughout San José. Additionally, 6,000 residential units and 4,855 jobs would be facilitated by the Five Wounds Urban Village Plan. These proposed uses could substantially increase noise levels at noise-sensitive land uses or could expose receptors to noise levels that exceed the City's General Plan policies and Municipal Code noise limits.

Future operations at existing and proposed noise-producing land uses are dependent on many variables and information, which are currently unavailable to allow meaningful projections of noise. Noise conflicts may be caused by noise sources, such as outdoor dining areas or bars, mechanical equipment, outdoor maintenance areas, truck loading docks and delivery activities, public address systems, and parking lots (e.g., opening and closing of vehicle doors, people talking, car alarms). Development under the proposed Plan would introduce new noise-generating sources adjacent to existing noise-sensitive areas and new noise-sensitive uses adjacent to existing noise sources.

Mitigation Measure 1b:

The City's standard permit condition shall be implemented as a condition of approval for all projects within the Plan Area. The standard permit condition states the following:

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

The implementation of the standard permit condition would reduce noise levels originating from the project site to a less-than-significant level.

Impact 2: **Exposure to Excessive Groundborne Vibration.** Demolition and construction activities facilitated by the Five Wounds Urban Village Plan may expose persons and buildings to excessive vibration levels.

Demolition and construction activities required for projects implemented by the Five Wounds Urban Village Plan may generate perceptible vibration levels and levels that could affect nearby structures when heavy equipment or impact tools (e.g. jackhammers, pile drivers, hoe rams) are used in the vicinity of nearby sensitive land uses. Building damage generally falls into three categories:

- 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; and

- Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

Policy EC-2.3 of the City of San José General Plan establishes a vibration limit of 0.08 in/sec PPV to minimize the potential for cosmetic damage to sensitive historic structures, and a vibration limit of 0.2 in/sec PPV to minimize damage at buildings of normal conventional construction.

Table 12 presents typical vibration levels that could be expected from construction equipment at distances of 25, 50, and 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 $\left({}^{D_{ref}}/_{D}\right)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet.

TABLE 12 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet Thresholds, feet	
			0.08 in/sec PPV	0.2 in/sec PPV
Pile Driver (Impact)	upper range	1.158	286	124
	typical	0.644	168	73
Pile Driver (Sonic)	upper range	0.734	189	82
	typical	0.170	50	22
Clam shovel drop		0.202	59	26
Hydromill (slurry wall)	in soil	0.008	4	2
	in rock	0.017	7	3
Vibratory Roller		0.210	61	27
Hoe Ram		0.089	28	13
Large bulldozer		0.089	28	13
Caisson drilling		0.089	28	13
Loaded trucks		0.076	24	11
Jackhammer		0.035	12	6
Small bulldozer		0.003	2	<1

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., January 2025.

The Five Wounds Urban Village Plan would facilitate the development of various projects in a variety of settings. With regard to groundborne vibration, there are two categories of construction projects: those including impact or vibratory pile driving techniques for foundation systems; and those that rely on alternate methods (e.g. CIDH piers, mat slab foundations), which produce substantially lower vibration levels. The severity of the vibration impact is determined by the

proximity of the project with respect to buildings and receptors. The sensitivity of buildings is also an important factor in evaluating impacts due to groundborne vibration.

The California Department of Transportation published a Transportation and Construction Guidance Manual in 2020 (Manual). The Manual developed a synthesis of various vibration criteria to assess the damage potential for representative categories of structures and effects upon people. The guideline criteria, summarized in Table 13, refine the categories and thresholds set forth in Policy EC-2.3, establishing seven separate categories. The first two categories (Categories 1 and 2) address human perceptibility of vibration only. The five remaining categories (Categories 3-7) address human perceptibility and potential for damage to buildings described as "Extremely fragile historic buildings, ruins, ancient monuments," "Fragile buildings," "Historic and some old buildings," "Older residential structures," "New residential structures," and "Modern industrial/commercial buildings."

Most, if not all, buildings in the Plan Area would fall into Categories 5 through 7. The goal in establishing vibration limits is to mitigate potential vibration impacts associated with demolition and construction activities to a less-than-significant level by establishing safe limits to protect structures from potential damage and to minimize vibration impacts on people and businesses. The vibration limits contained in Policy EC-2.3 utilized criteria from literature available to the City in 2008 that are conservative, and given the broad categories, are now believed to be too general for buildings in the Plan Area. Given that the new guideline criteria best accomplish the goal to identify and mitigate construction vibration impacts, it is recommended that these criteria be utilized to implement General Plan Policy EC-2.3 for projects facilitated by the Five Wounds Urban Village Plan.

For projects that produce vibration levels falling under Categories 1 and 2, the primary issue related to construction vibration is human perceptibility and the potential for annoyance. Vibration levels may 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.

For projects that produce vibration levels exceeding the thresholds for Categories 3 through 7, construction vibration would be expected to cause both human annoyance and the possibility of cosmetic damage. A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[9] The findings of this study have been applied to buildings affected by construction-generated vibrations.[10] As reported in USBM RI 8507[9] and reproduced by Dowding,[10] Figure 8 presents the damage probability, in terms of "threshold damage" (described above as cosmetic damage), "minor damage," and "major damage," at varying

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

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

vibration levels. Threshold damage, or cosmetic damage, would entail hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage would include hairline cracking in masonry or the loosening of plaster, and major structural damage would include wide cracking or shifting of foundation or bearing walls. As shown in Figure 8, maximum vibration levels of 0.5 in/sec PPV or lower would result in about 5% chance of cosmetic damage and no minor or major damage. There would be about 5% chance of minor damage with vibration levels of about 1.8 in/sec PPV and about 5% chance of major damage with vibration levels of about 2.5 in/sec PPV. Vibration levels this high would not be expected at construction sites within the Plan Area.

TABLE 13 Construction Vibration Annoyance and Damage Potential Threshold Criteria

Category	Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
1	0.01	Barely perceptible	No effect
2	0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
3	0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
4	0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
5	0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
6	0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
7	0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

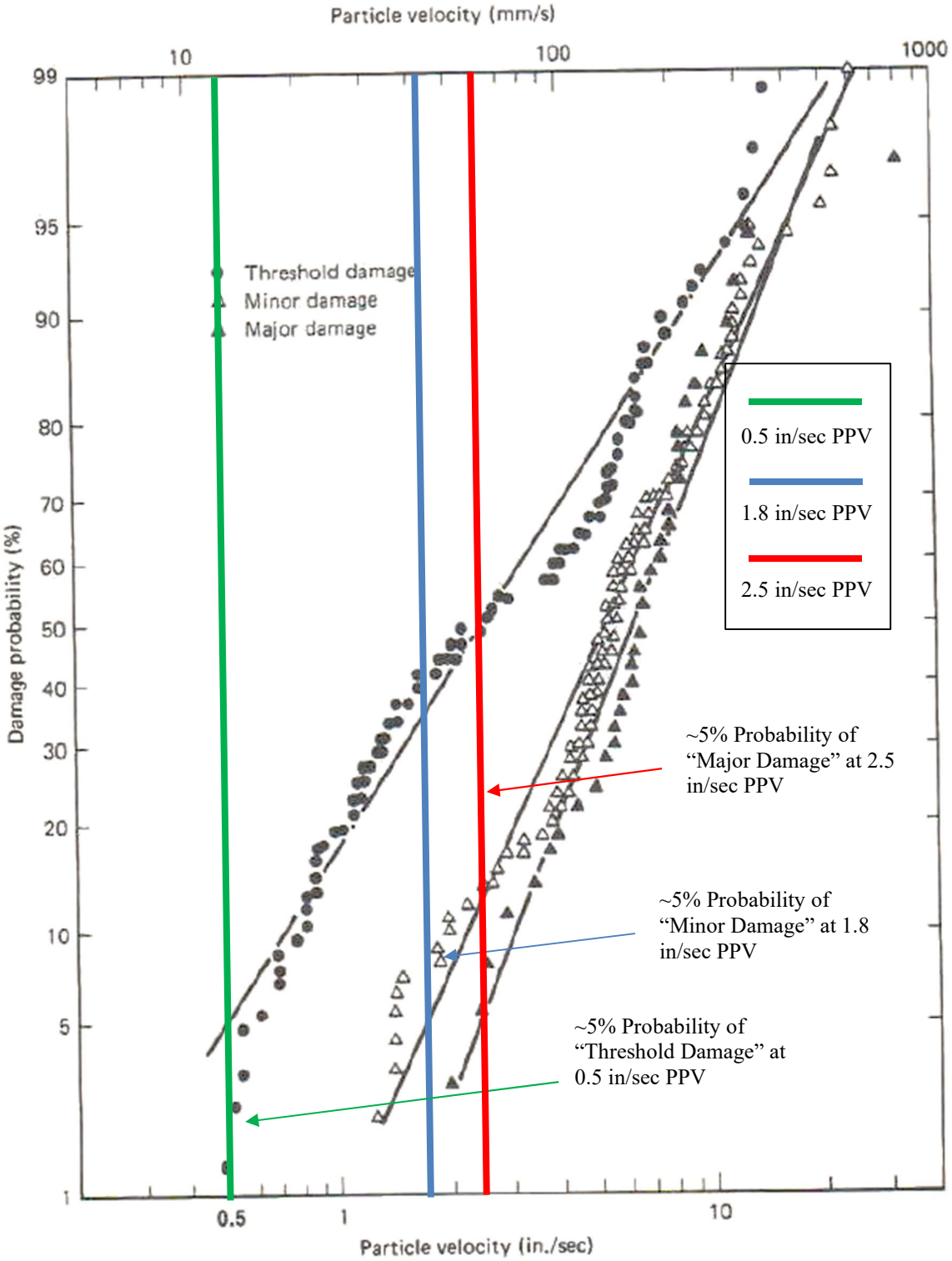
Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, April 2020.

No Pile Driving & Receiving Buildings More than 60 feet from the Project Site

When off-site, receiving buildings are located more than 60 feet from the nearest project site boundary, construction vibration levels would be below 0.08 in/sec PPV for all equipment, which would result in a less-than-significant impact and would not require mitigation.

Projects not requiring pile driving that occur within 60 feet of the nearest historical building or within 30 feet of the nearest conventional building would result in a potentially significant impact and require mitigation. Projects requiring impact or vibratory pile driving to occur within 290 feet of the nearest historical building or within 125 feet of the nearest conventional building would result in a potentially significant impact and require mitigation.

FIGURE 8 Probability of Cracking and Fatigue from Repetitive Loading



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

Mitigation Measure 2:

No Pile Driving, Conventional Buildings Within 30 feet from the Project Site

For construction projects not requiring pile driving with conventional off-site buildings located within 30 feet of the nearest project site boundary, the 0.2 in/sec PPV threshold would be exceeded. The following best available controls shall be required:

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

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

- Smaller equipment (less than 18,000 pounds) shall be used near the property lines or adjacent sensitive buildings to minimize vibration levels. For example, a smaller vibratory roller similar to a Caterpillar model CP433E vibratory compactor could be used when compacting materials within 30 feet of sensitive buildings. The smaller equipment intended to implement this requirement shall be individually identified among the list of equipment required under the above condition as the subset of equipment allowed for use at the property lines.

- Avoid dropping heavy equipment and using vibratory rollers within 30 feet of sensitive structures. Use alternative methods for breaking up existing pavement, such as a pavement grinder, instead of dropping heavy objects, within 30 feet of structurally sensitive buildings. Select demolition methods that do not involve large impact tools, such as hoe-rams, within 30 feet of sensitive buildings. Portable jackhammers, saws, or grinders shall be used to minimize impacts to the ground.

Pile Driving Projects and Projects with Historical Buildings Within 60 feet from the Project Site

For projects with off-site historical buildings located within 60 feet of the nearest project boundary or where pile driving is planned within 286 feet of historical buildings or within 125 feet or conventional buildings, the City's thresholds would be exceeded. In addition to the above controls, the following best available controls shall be required:

- Notify neighbors within 500 feet of the construction site of the construction schedule and that there could be noticeable vibration levels resulting from pile driving.

- For all projects requiring impact pile driving, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile.

- For all projects requiring impact pile driving, jet or partially jet piles into place to minimize the number of impacts required to seat the pile.
- A construction vibration monitoring plan shall be implemented to document conditions prior to, during, and after construction or pile driving activities. All plan tasks shall be undertaken under the direction of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. The construction vibration monitoring plan should be implemented to include the following tasks:

    - Identification of sensitivity to groundborne vibration of nearby structures. A vibration survey (generally described below) would need to be performed.

    - Performance of a photo survey, elevation survey, and crack monitoring survey for each of these structures. Surveys shall be performed prior to any demolition or pile driving activity, in regular interval during construction or pile driving, and after completion and shall include internal and external crack monitoring in structures, settlement, and distress and shall document the condition of foundations, walls and other structural elements in the interior and exterior of said structures.

    - Development of a vibration monitoring and construction contingency plan to identify structures where monitoring would be conducted, set up a vibration monitoring schedule, define structure-specific vibration limits, and address the need to conduct photo, elevation, and crack surveys to document before and after demolition/construction or pile driving. Alternative construction methods would be identified for when vibration levels approach the limits that are stated in the General Plan such as Policy EC-2.3.

    - If vibration levels approach limits, suspend construction and implement alternative construction methods to either lower vibration levels or secure the affected structures.

    - Conduct post-survey on structures where either monitoring has indicated high levels or complaints of damage has been made. Make appropriate repairs or compensation where damage has occurred as a result of construction activities.

    - The results of all vibration monitoring shall be summarized and submitted in a report shortly after substantial completion of each phase identified in the project schedule. The report will include a description of measurement methods, equipment used, calibration certificates, and graphics as required to clearly identify vibration-monitoring locations. An explanation of all events that exceeded vibration limits will be included together with proper documentation supporting any such claims.

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

The implementation of these mitigation measures would reduce vibration levels at buildings surrounding the project sites within the Plan Area to below the City's thresholds or where reducing the levels is not possible, restore the off-site structures to pre-construction conditions by repairing any potential damage caused by construction activities at the project sites or provide adequate compensation. This would reduce the impact to a less-than- significant level.

Impact 3: **Excessive Aircraft Noise.** The Plan Area is located approximately 2.2 miles from San José Mineta International Airport, and the noise environment attributable to aircraft is considered normally acceptable under the Santa Clara County ALUC noise compatibility policies for residential land uses.

San José Mineta International Airport is a public-use airport located approximately 2.2 miles or more northwest of the Plan Area. According to the City's Airport Master Plan Environmental Impact Report, the project site lies outside the 60 dBA CNEL/DNL contour line (see Figure 6). According to Policy EC-1.11 of the City's General Plan, the required safe and compatible threshold for exterior noise levels due to aircraft would be at or below 65 dBA CNEL/DNL. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

Assuming standard construction materials for aircraft noise below 60 dBA DNL, the future interior noise levels resulting from aircraft would be 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.**

Cumulative Impacts

Cumulative noise impacts would result from either cumulative traffic noise increases under future conditions or temporary construction noise from cumulative construction projects.

Since the Project Buildout would only occur under future cumulative conditions, the project-generated traffic noise discussion included in Impact 1b is the cumulative traffic increase. No further discussion required.

Cumulative construction impacts would potentially be significant if two or more projects located within 500 feet of each other have concurrent or consecutive construction schedules with shared noise-sensitive receptors. However, multiple factors would contribute to the cumulative construction evaluation:

- Size of each construction project site;
- Total exposure noise-sensitive receptors would have to elevated construction levels;
- Complexity of the construction projects (e.g., whether pile driving is required);
- Hours of construction activity for all projects; and
- Existing ambient noise environment of the shared noise-sensitive receptors.

While cumulative construction is determined by overall disturbance construction noise would cause the noise-sensitive receptors, a less-than-significant cumulative construction impact would occur for multiple projects lasting less than one year, assuming both construction projects incorporate the City's Standard Permit Condition for Construction-Related Noise. These projects typically do not require pile driving and would limit the overall exposure of the noise-sensitive receptors to less than one year. If the overlapping of the construction activities results in exposure of more than one year, the measures included in the standard permit condition would reduce the noise levels as much as possible to limit the noise level exposure of any one receptor at any given time from both sites. No additional measures would not be required.

For potential cumulative projects scheduled to last more than one year, the construction noise logistics plan shall take into account the cumulative project occurring within 500 feet and consider additional measures to protect the shared receptors. These additional measures may include, but not be limited to, the following:

- A temporary noise control blanket barrier could be erected, if necessary, along building façades facing construction sites or on the scaffolding of the construction buildings that face the noise-sensitive receptors. Noise control blanket barriers can be rented and quickly erected.
- Direct all truck traffic away from the shared sensitive receptors.

- Notify all shared noise-sensitive receptors of the construction schedules, in writing, and provide a written schedule of "noisy" construction activities occurring on all cumulative sites.

- Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses. Temporary noise barriers could reduce construction noise levels by 5 dBA.

- Where feasible, locate construction staging areas far from each other and as far as possible from the shared noise-sensitive receptors.

Incorporating these measures into the construction noise logistics plan would help reduce any additional disturbance to noise-sensitive receptors located within 500 feet of two or more cumulative construction sites. Additional project-specific measures may be required.

Two or more large projects occurring within 500 feet of each other that both require pile driving, both occurring outside the City's allowable hours, and/or both occurring for extended periods of time (i.e., three or more years) would potentially generate a significant and unavoidable cumulative construction impact with shared noise-sensitive receptors being exposed to noisy construction work over an extended period of time.

APPENDIX A

FIGURE A1 Daily Trend in Noise Levels at LT-1, Wednesday, May 15, 2024

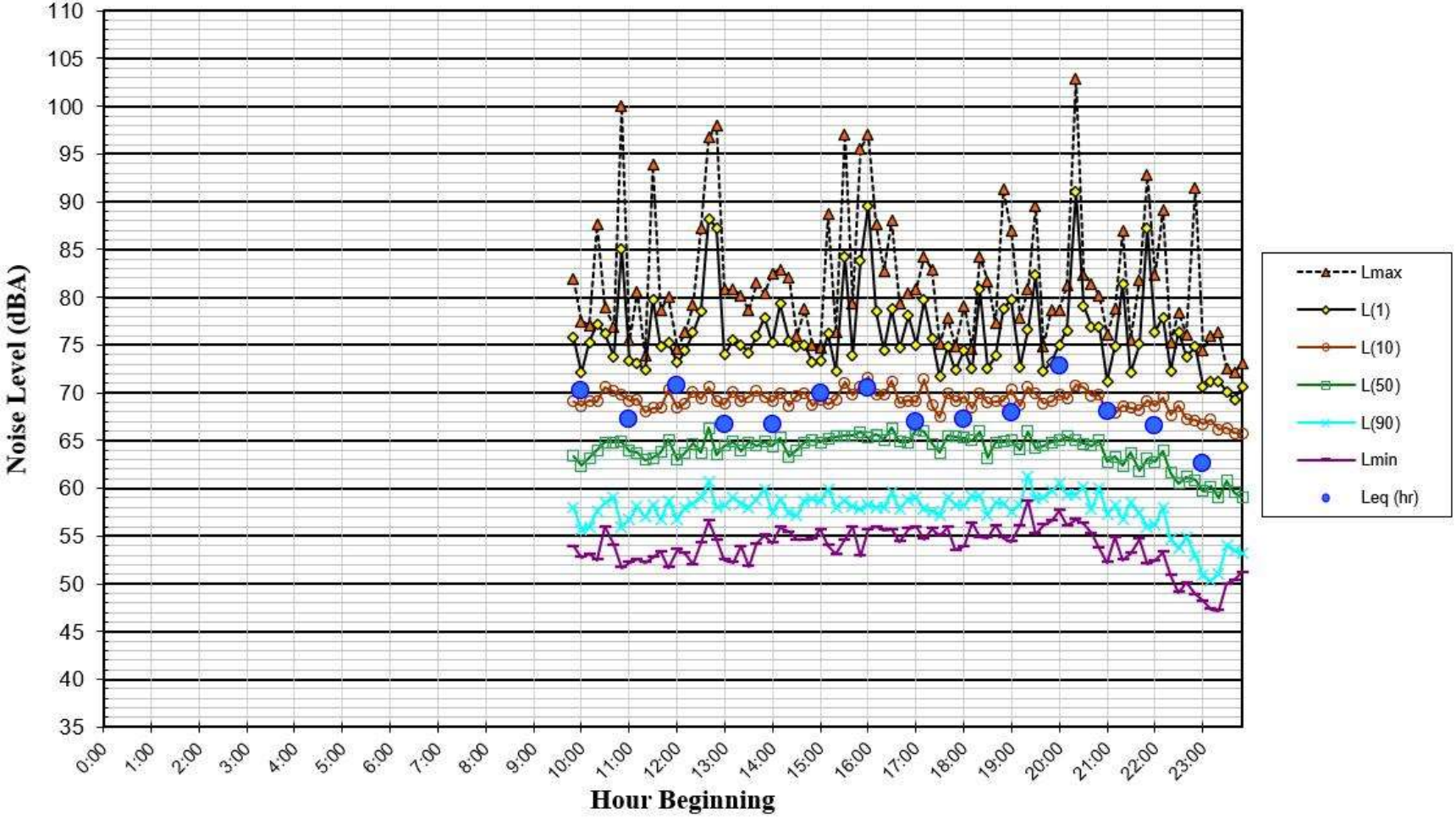


FIGURE A2 Daily Trend in Noise Levels at LT-1, Thursday, May 16, 2024

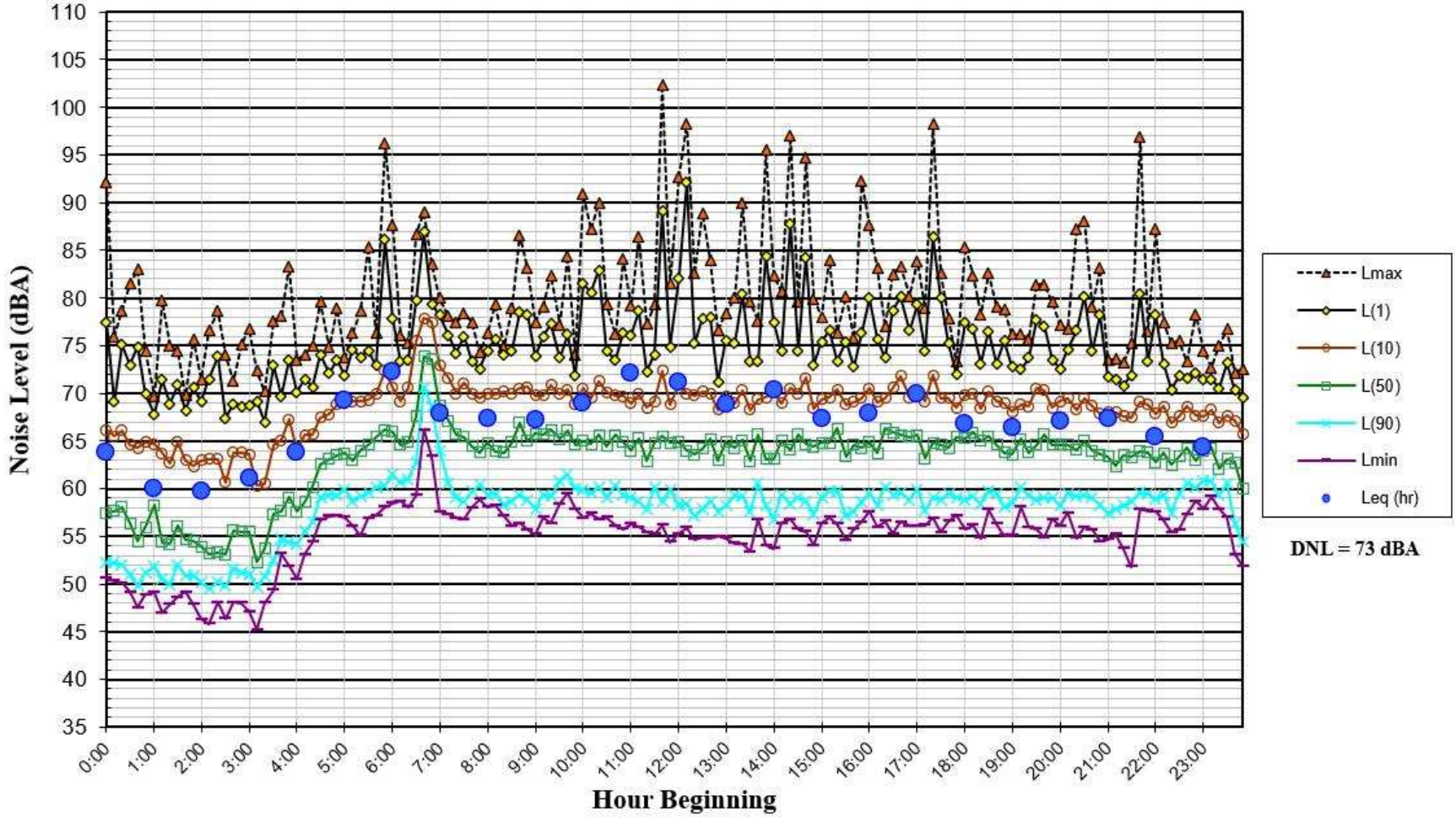


FIGURE A3 Daily Trend in Noise Levels at LT-1, Friday, May 17, 2024

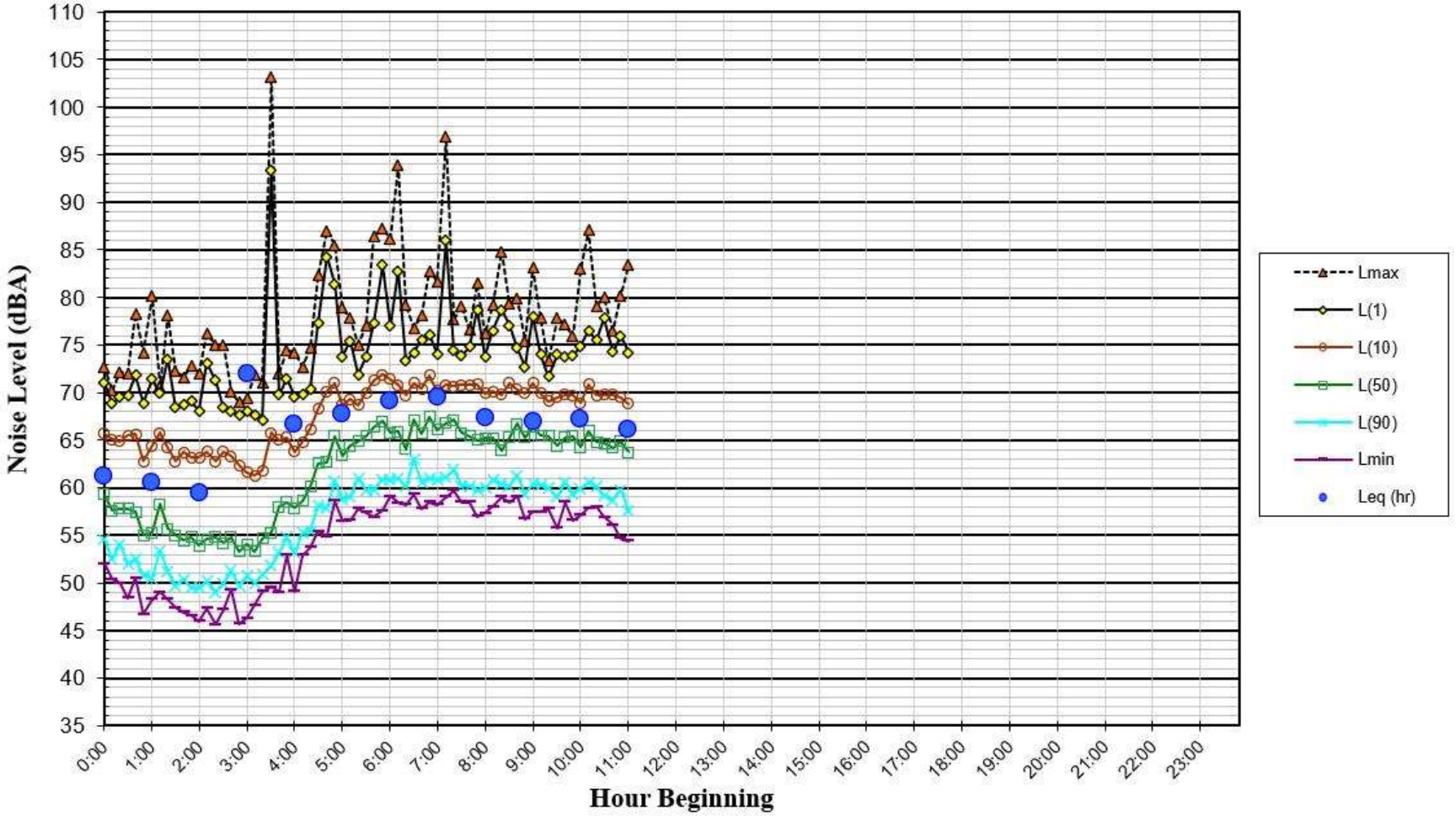


FIGURE A4 Daily Trend in Noise Levels at LT-2, Wednesday, May 15, 2024

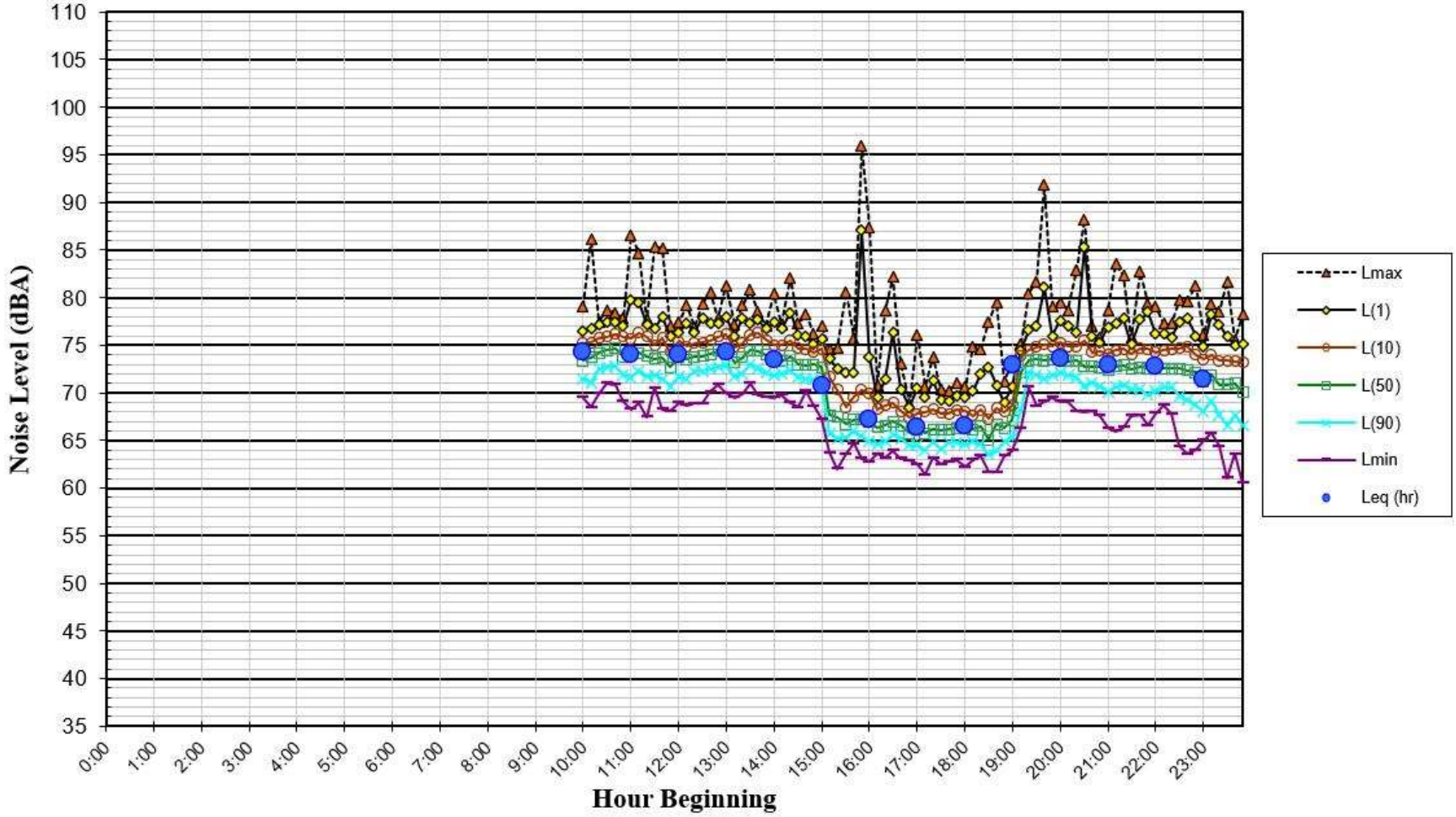


FIGURE A5 Daily Trend in Noise Levels at LT-2, Thursday, May 16, 2024

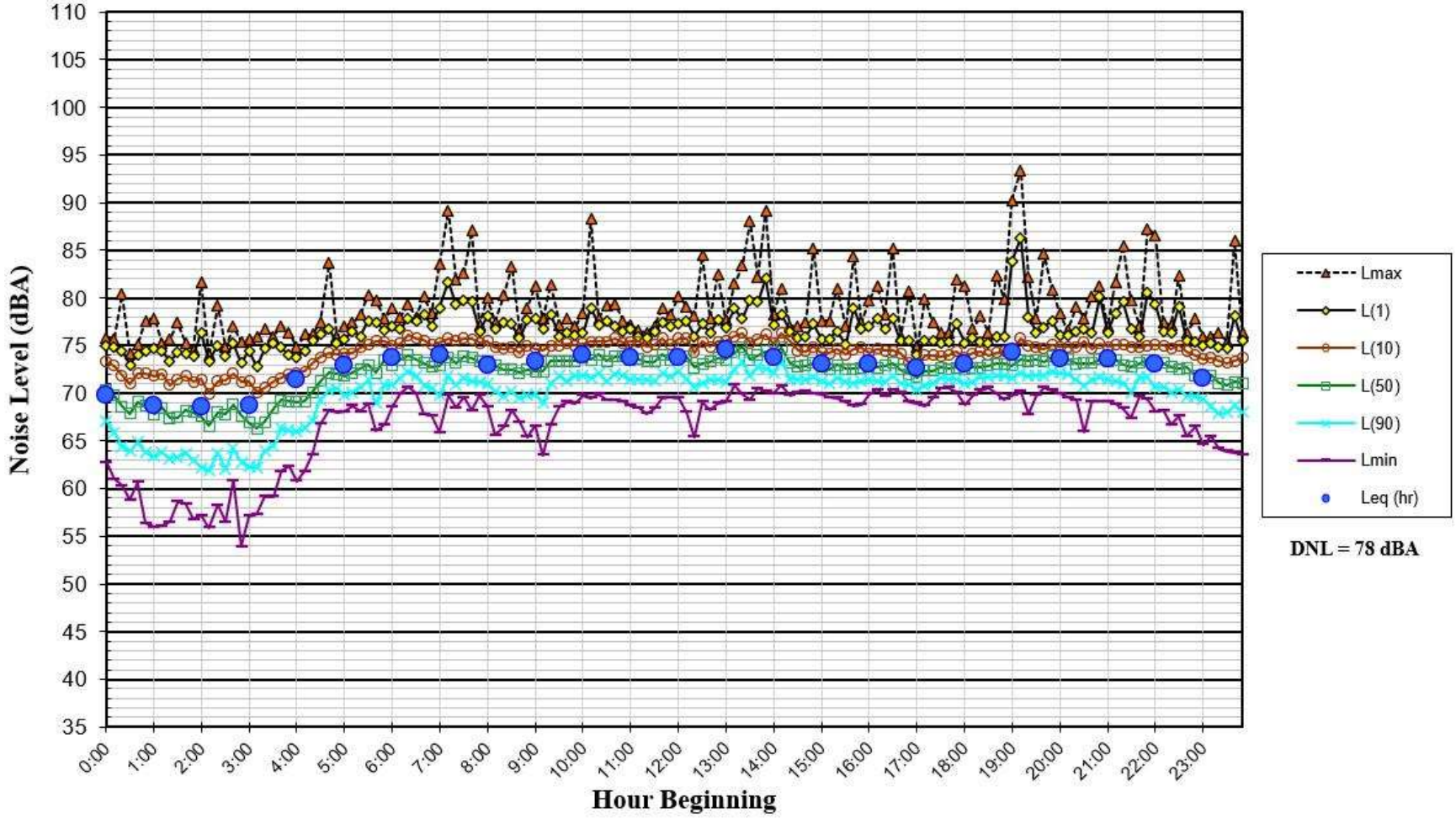


FIGURE A6 Daily Trend in Noise Levels at LT-2, Friday, May 17, 2024

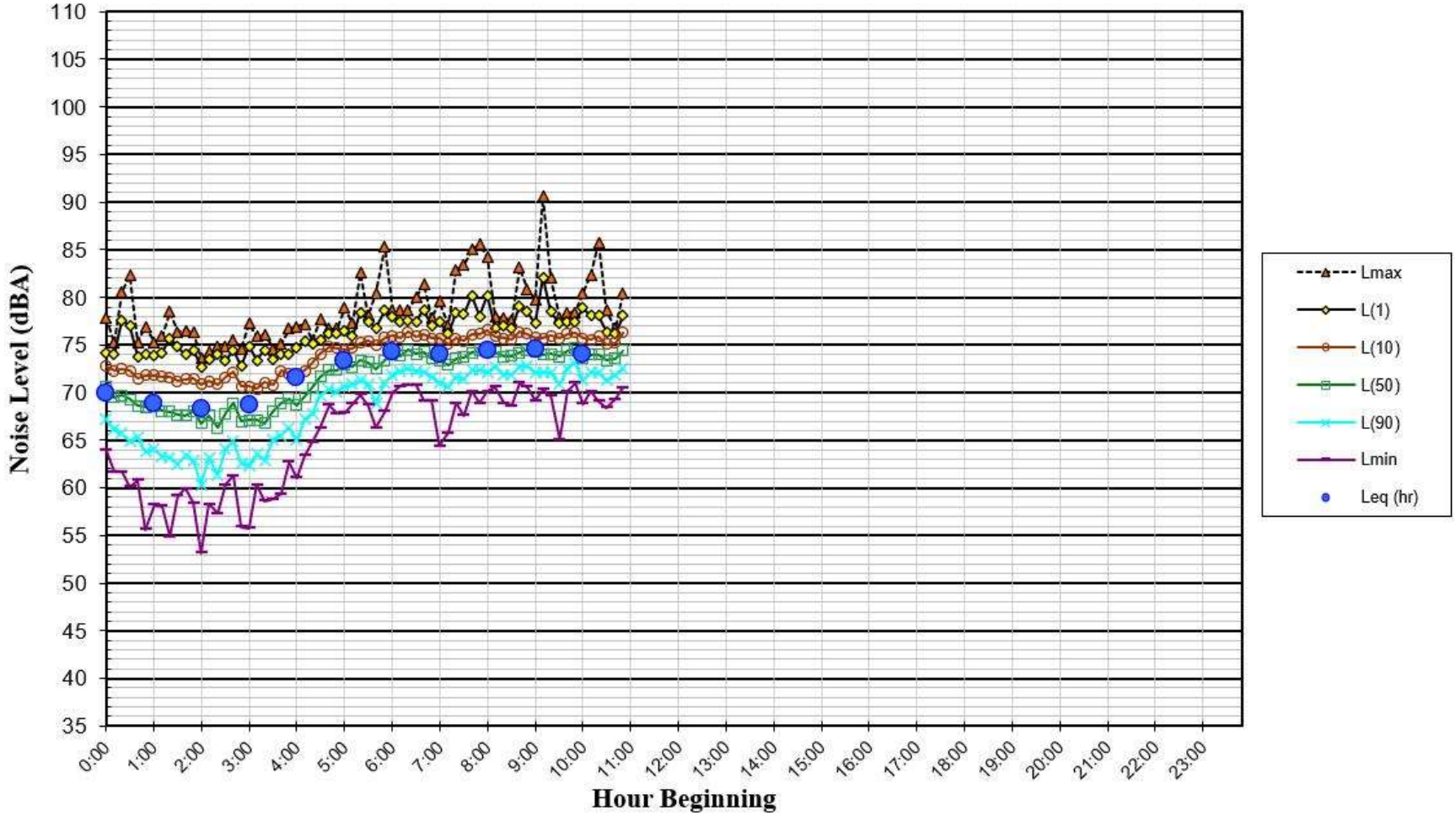


FIGURE A7 Daily Trend in Noise Levels at LT-3, Wednesday, May 15, 2024

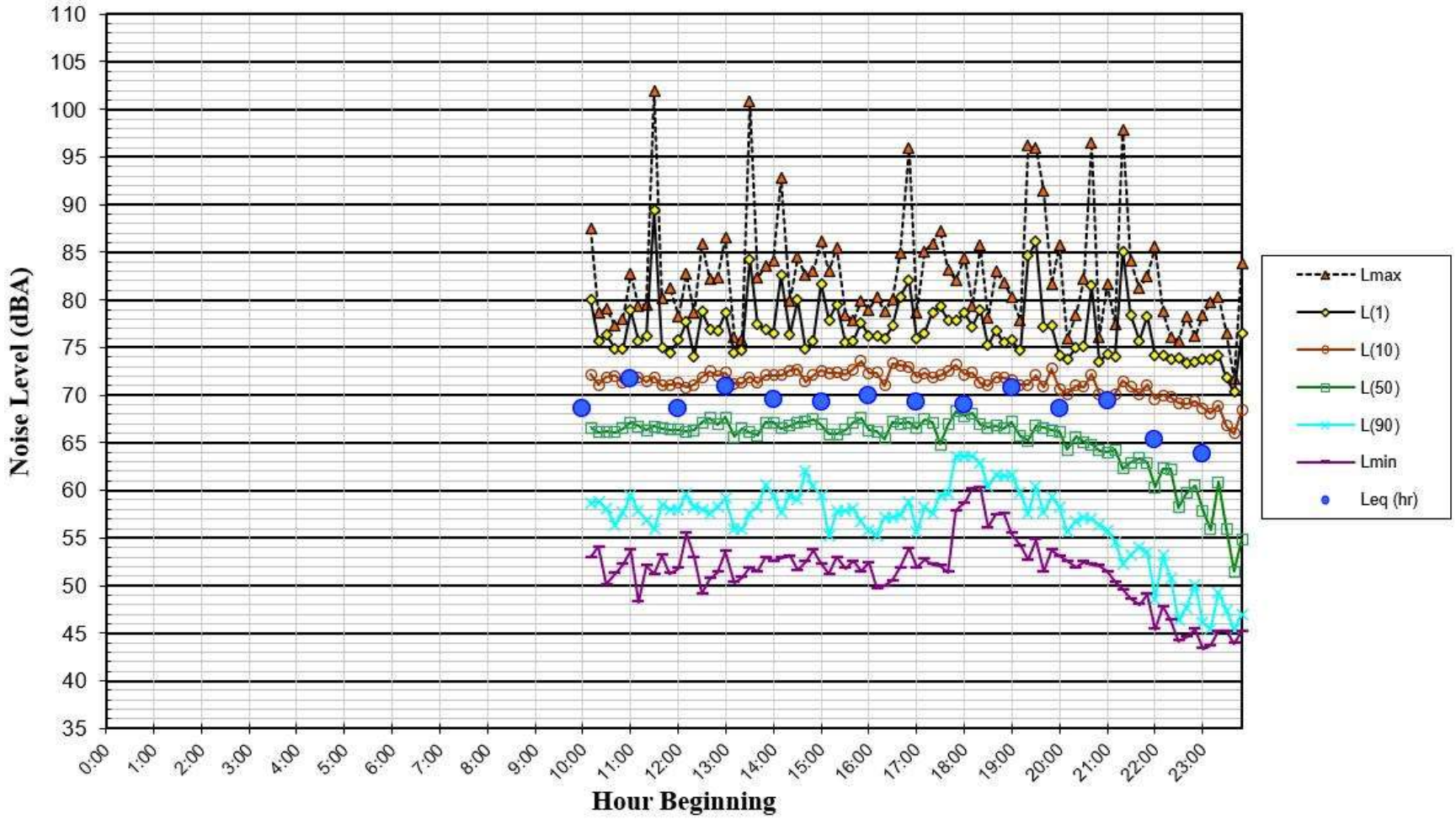


FIGURE A8 Daily Trend in Noise Levels at LT-3, Thursday, May 16, 2024

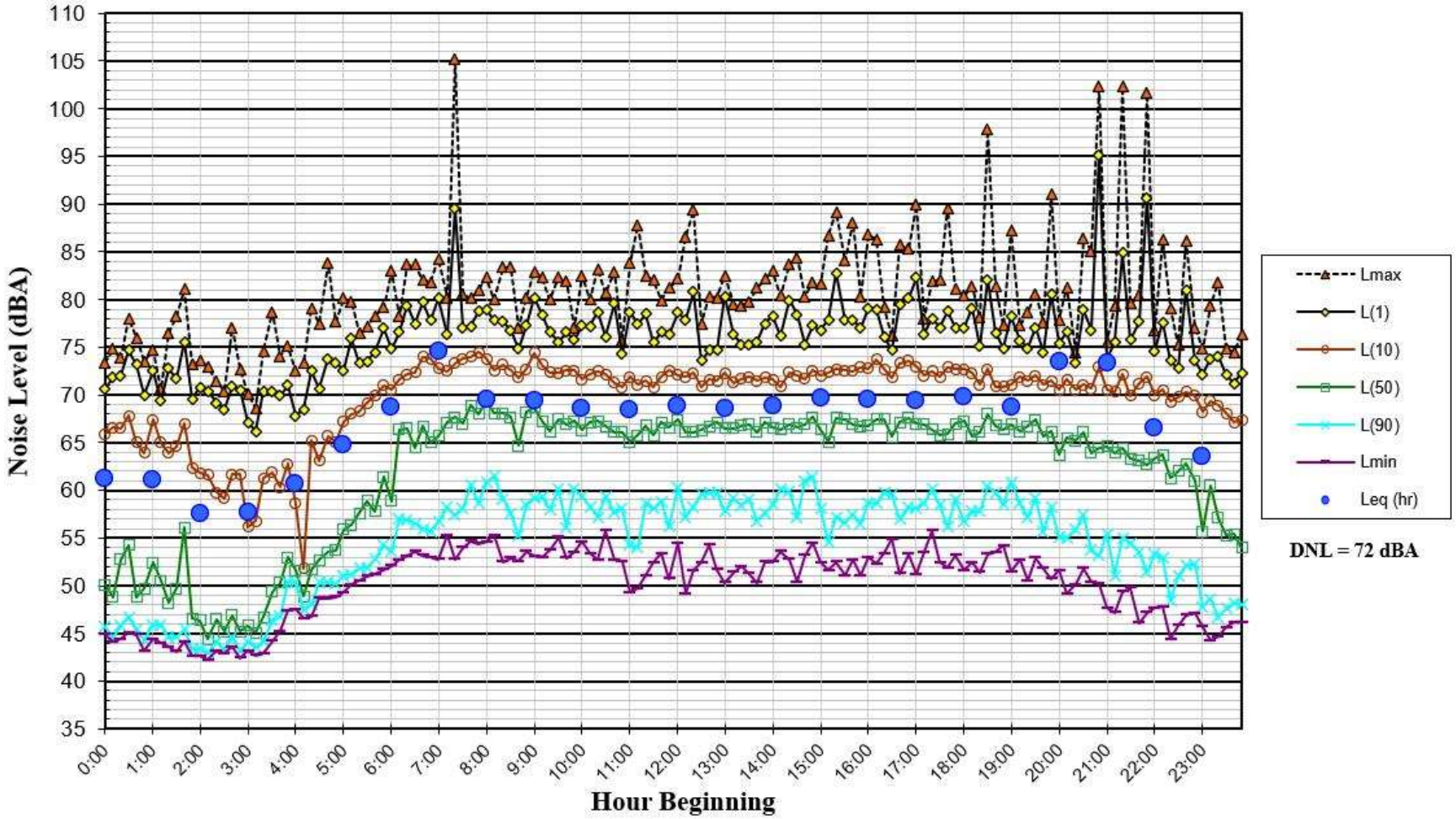


FIGURE A9 Daily Trend in Noise Levels at LT-3, Friday, May 17, 2024

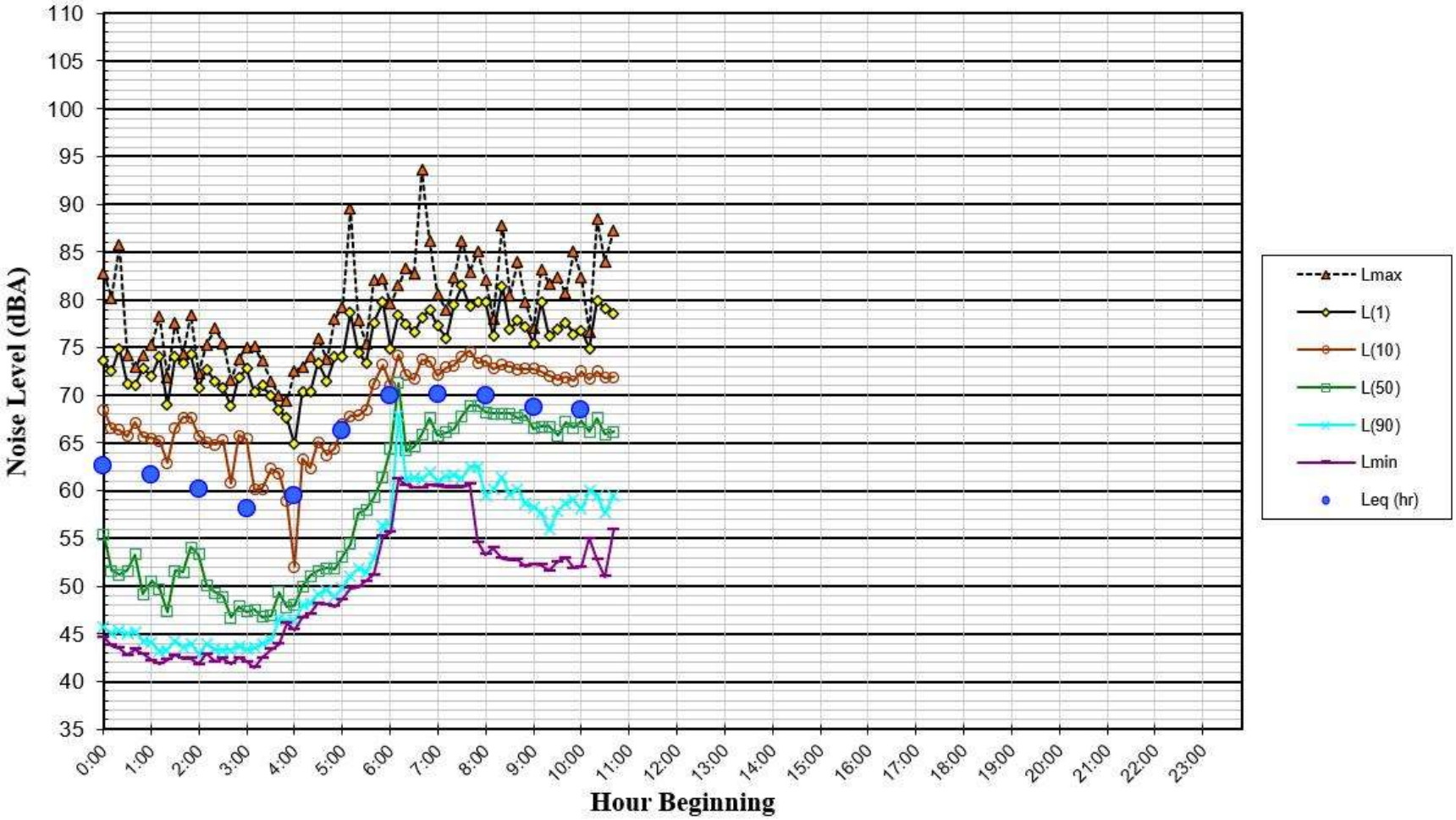


FIGURE A10 Daily Trend in Noise Levels at LT-4, Wednesday, May 15, 2024

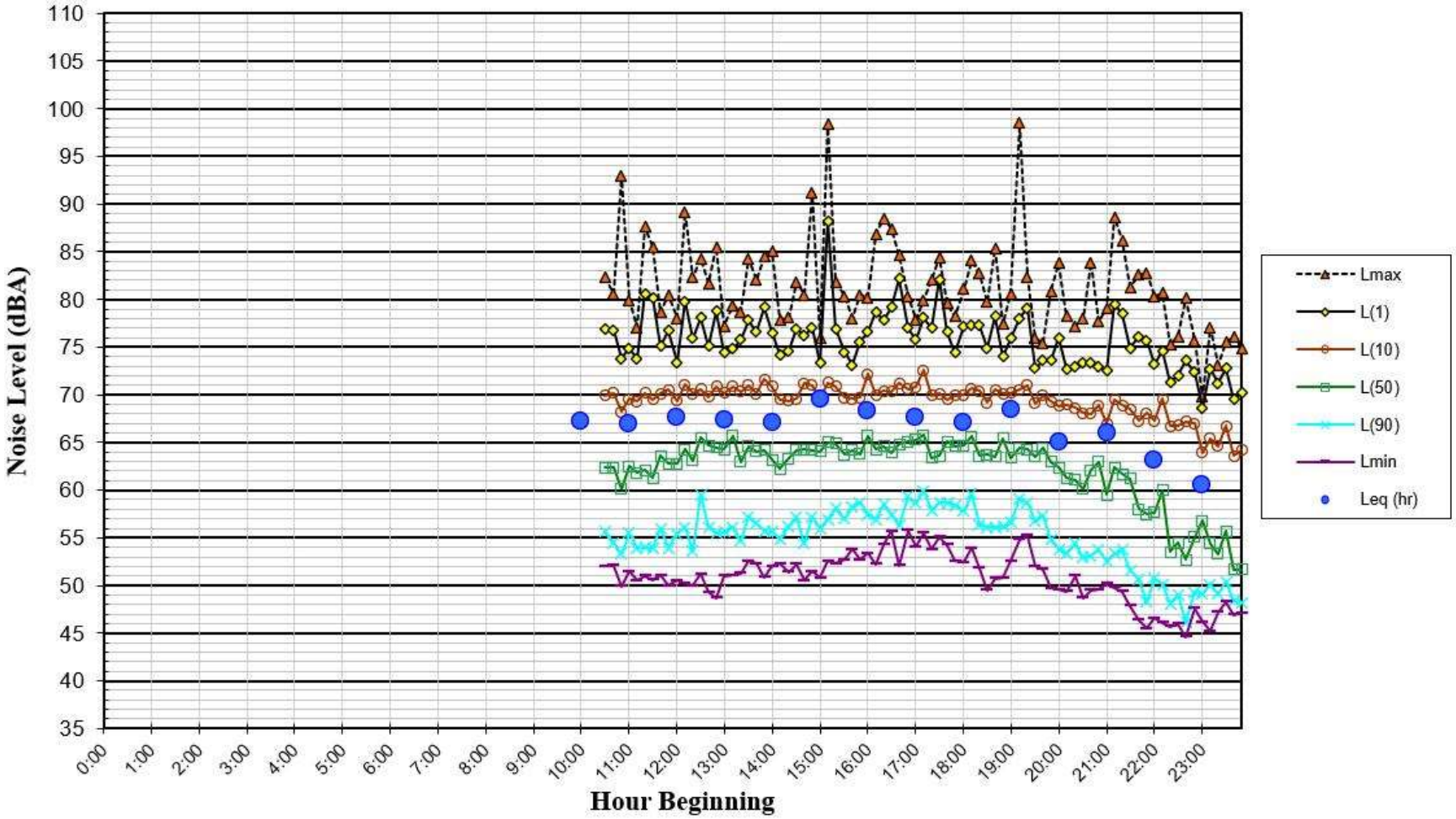


FIGURE A11 Daily Trend in Noise Levels at LT-4, Thursday, May 16, 2024

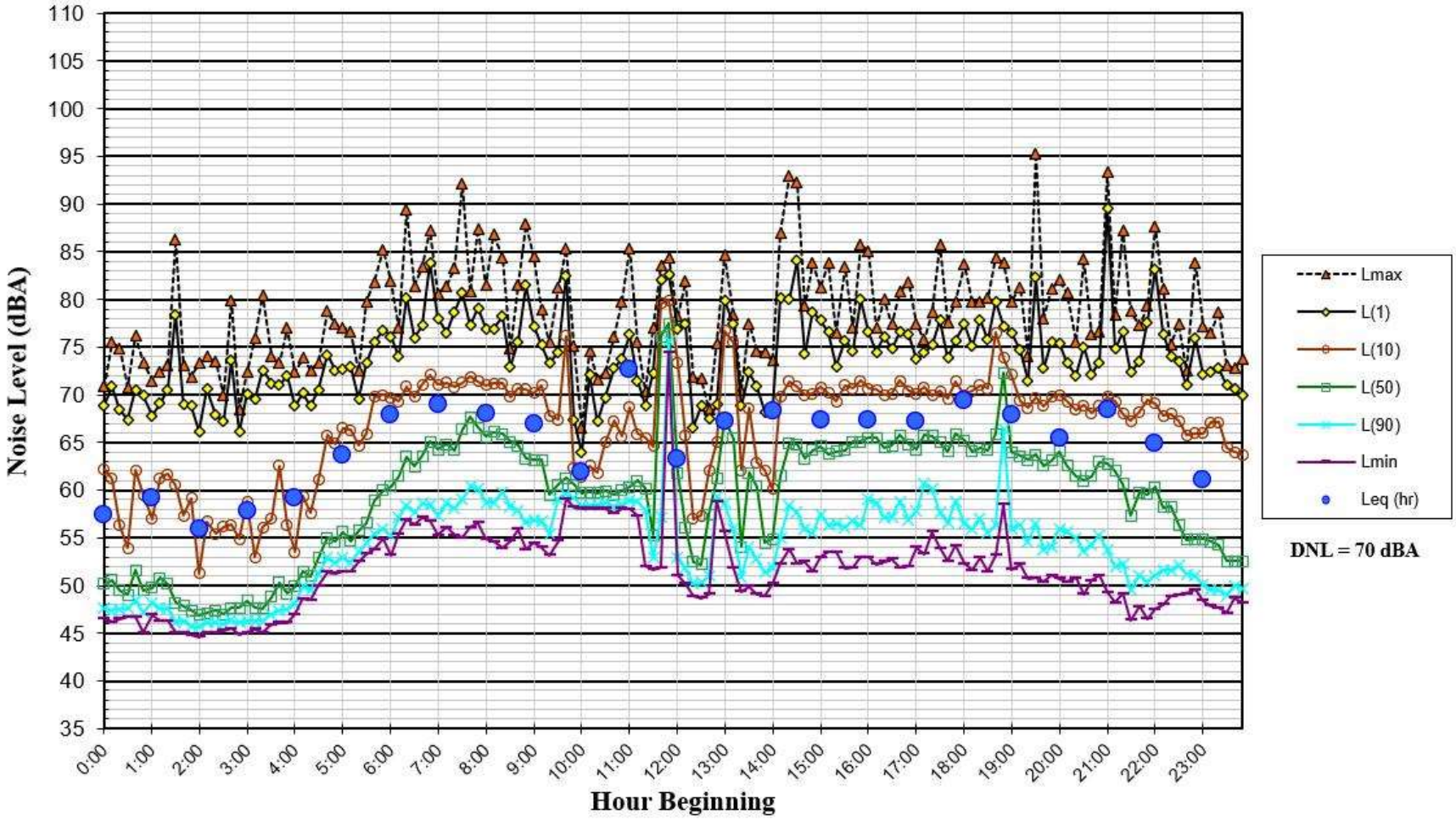


FIGURE A12 Daily Trend in Noise Levels at LT-4, Friday, May 17, 2024

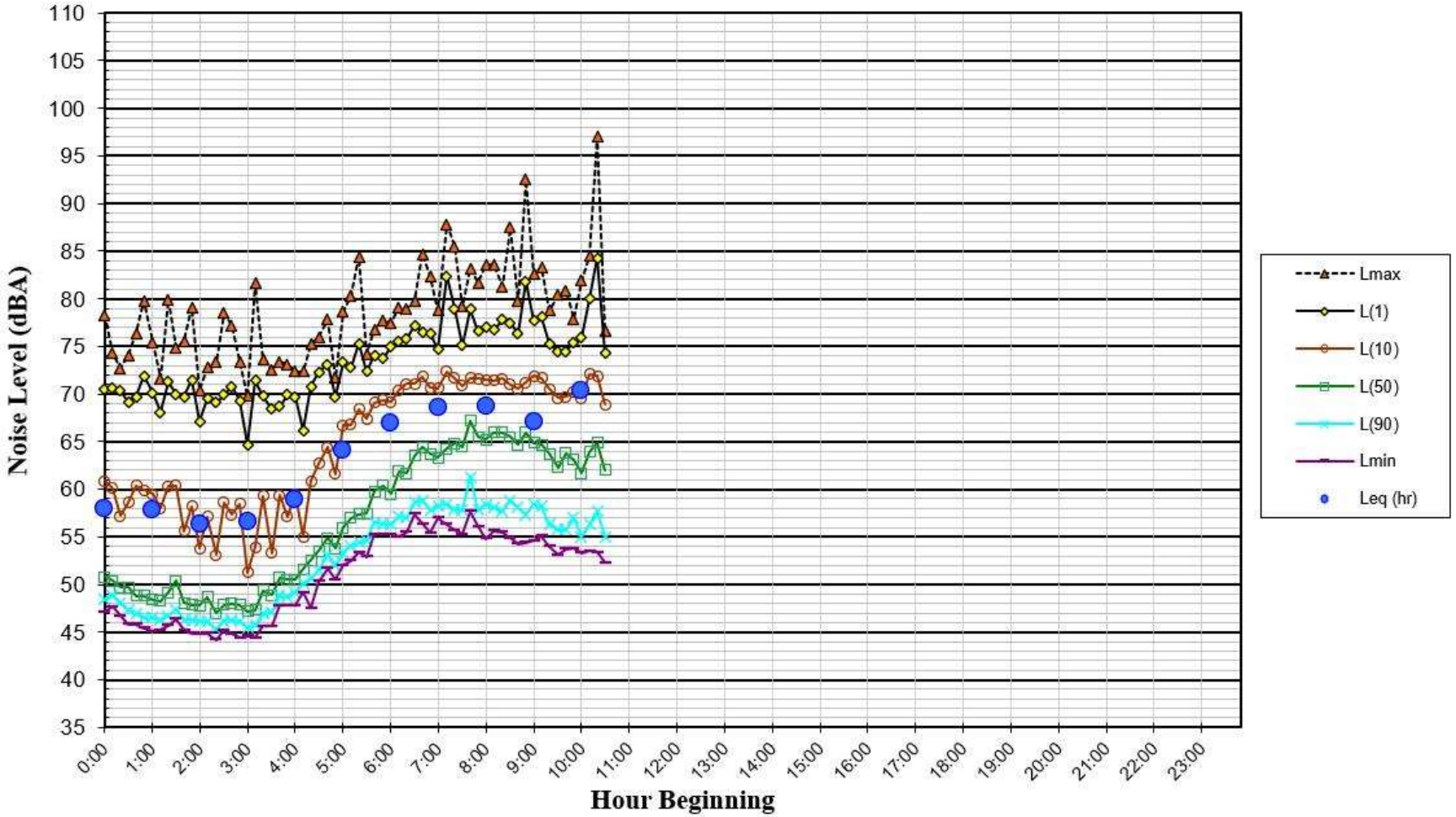


FIGURE A13 Daily Trend in Noise Levels at LT-5, Tuesday, September 17, 2019

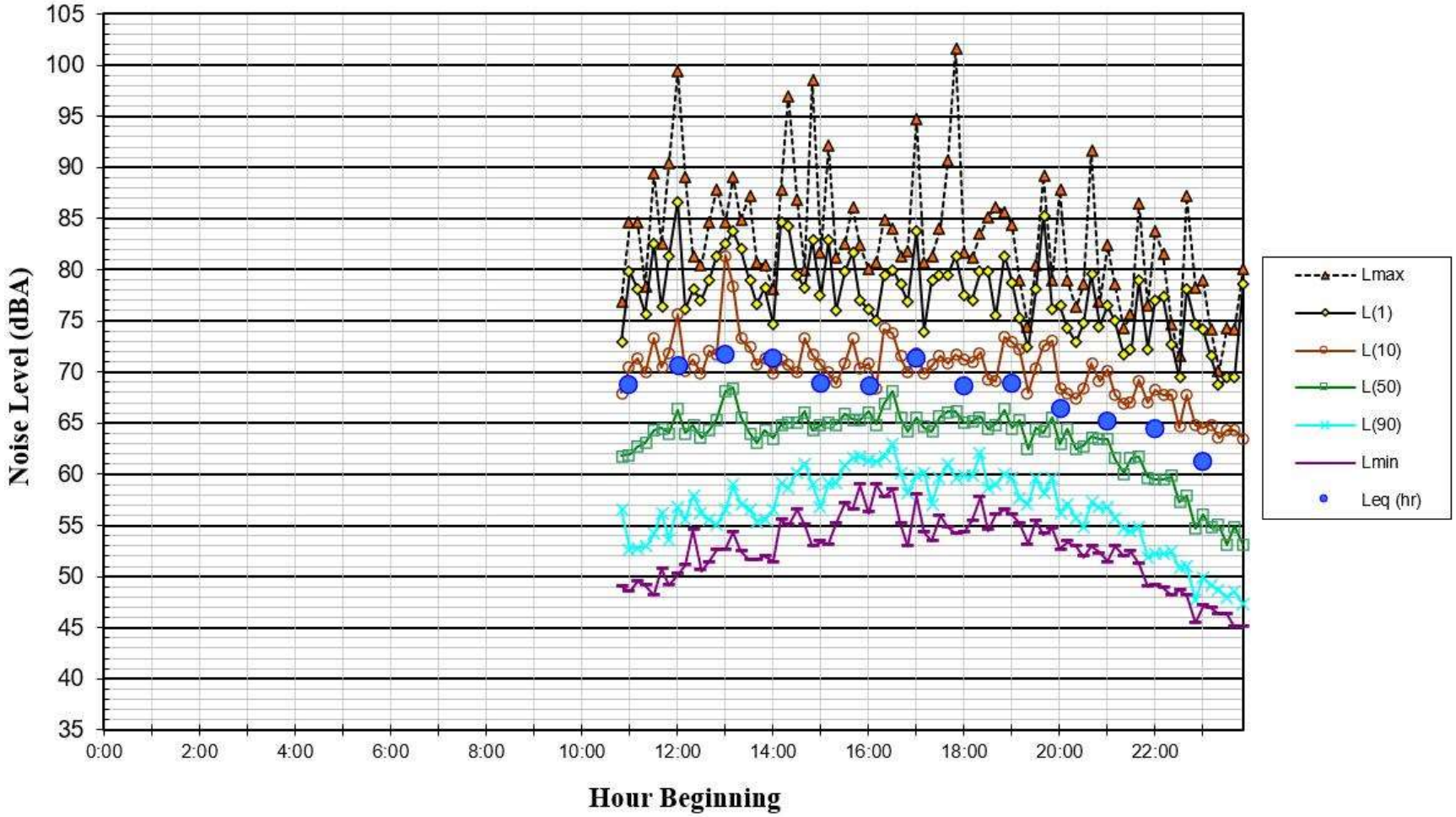


FIGURE A14 Daily Trend in Noise Levels at LT-5, Wednesday, September 18, 2019

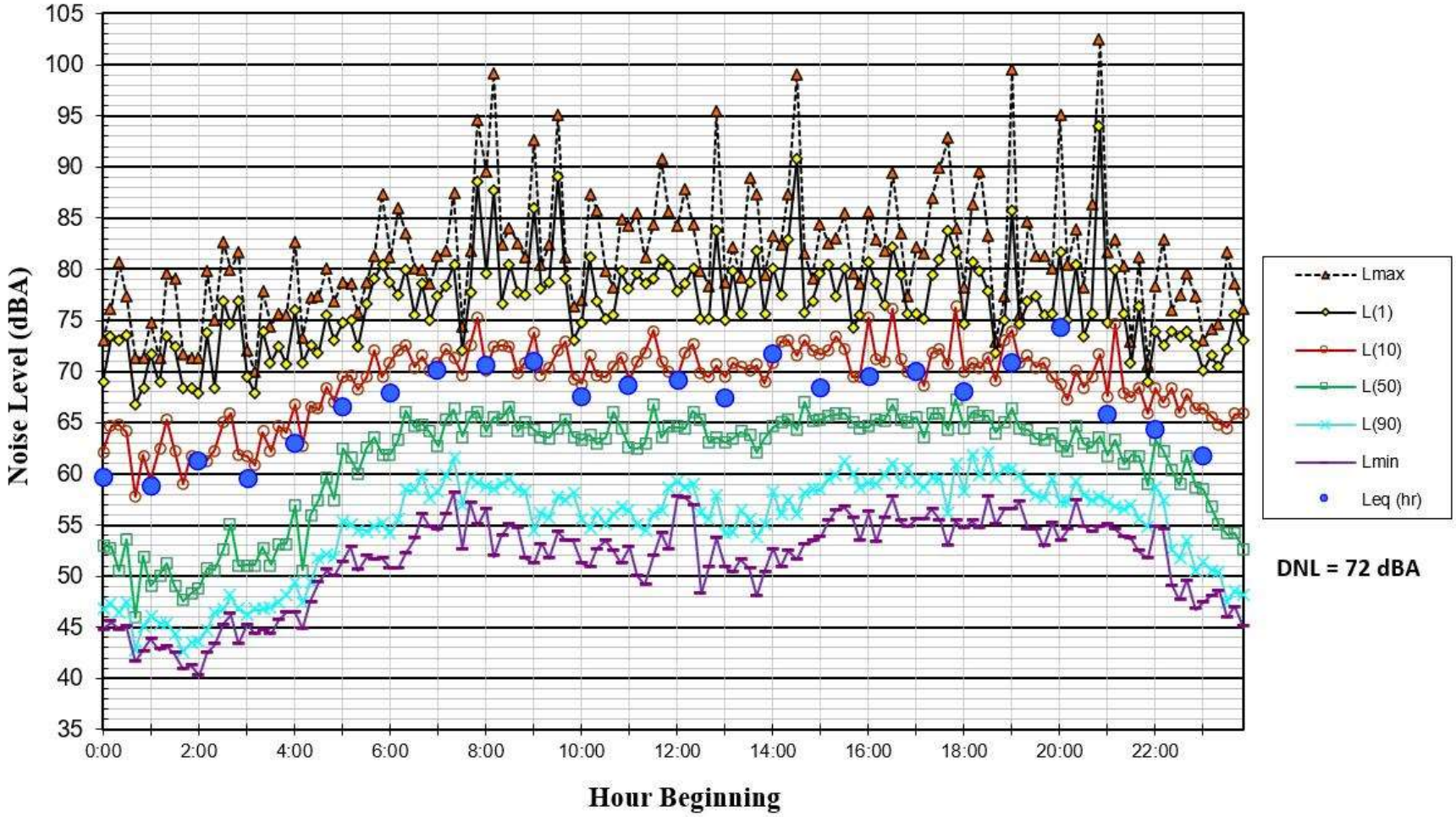


FIGURE A15 Daily Trend in Noise Levels at LT-5, Thursday, September 19, 2019

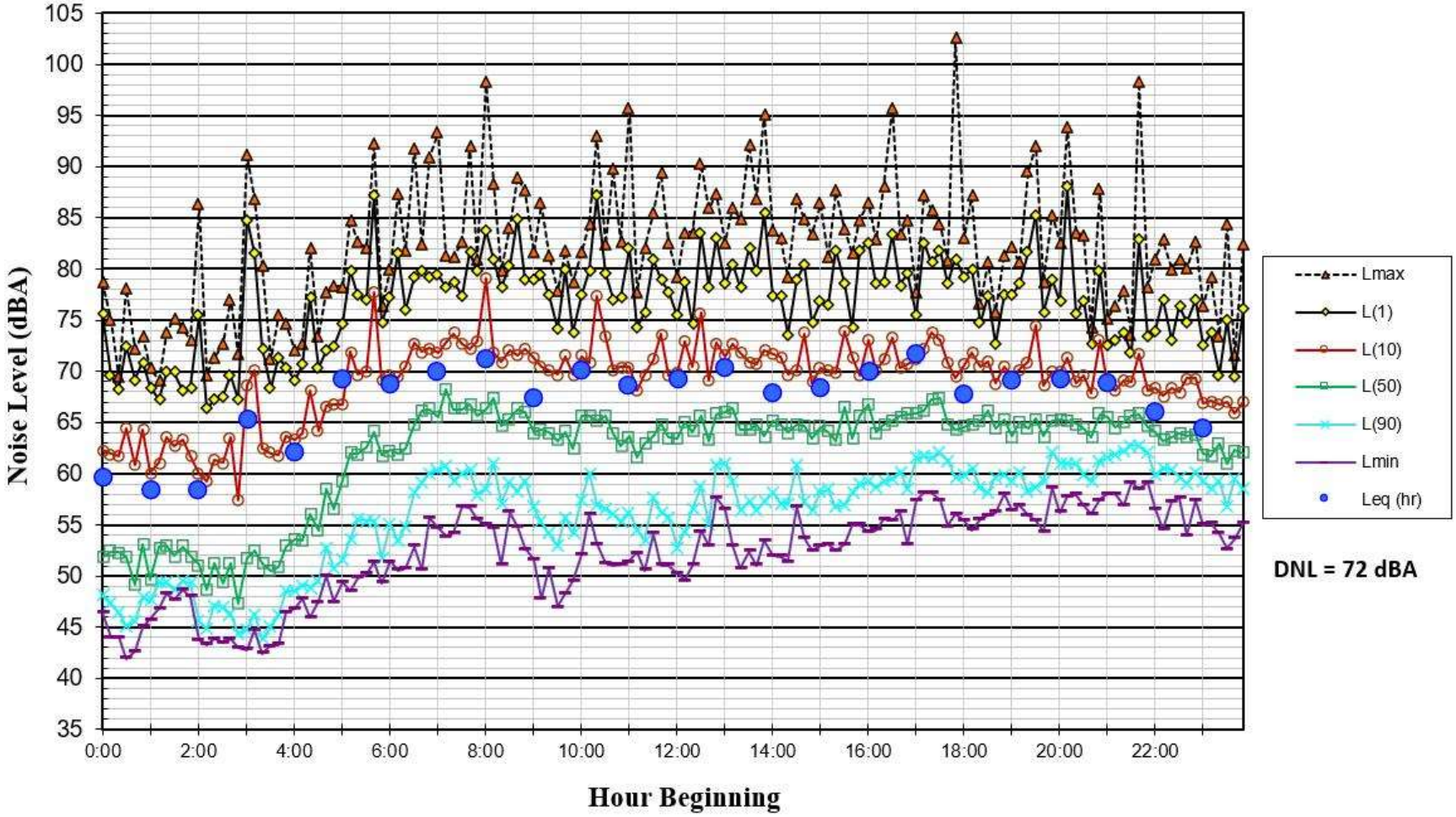


FIGURE A16 Daily Trend in Noise Levels at LT-5, Friday, September 20, 2019

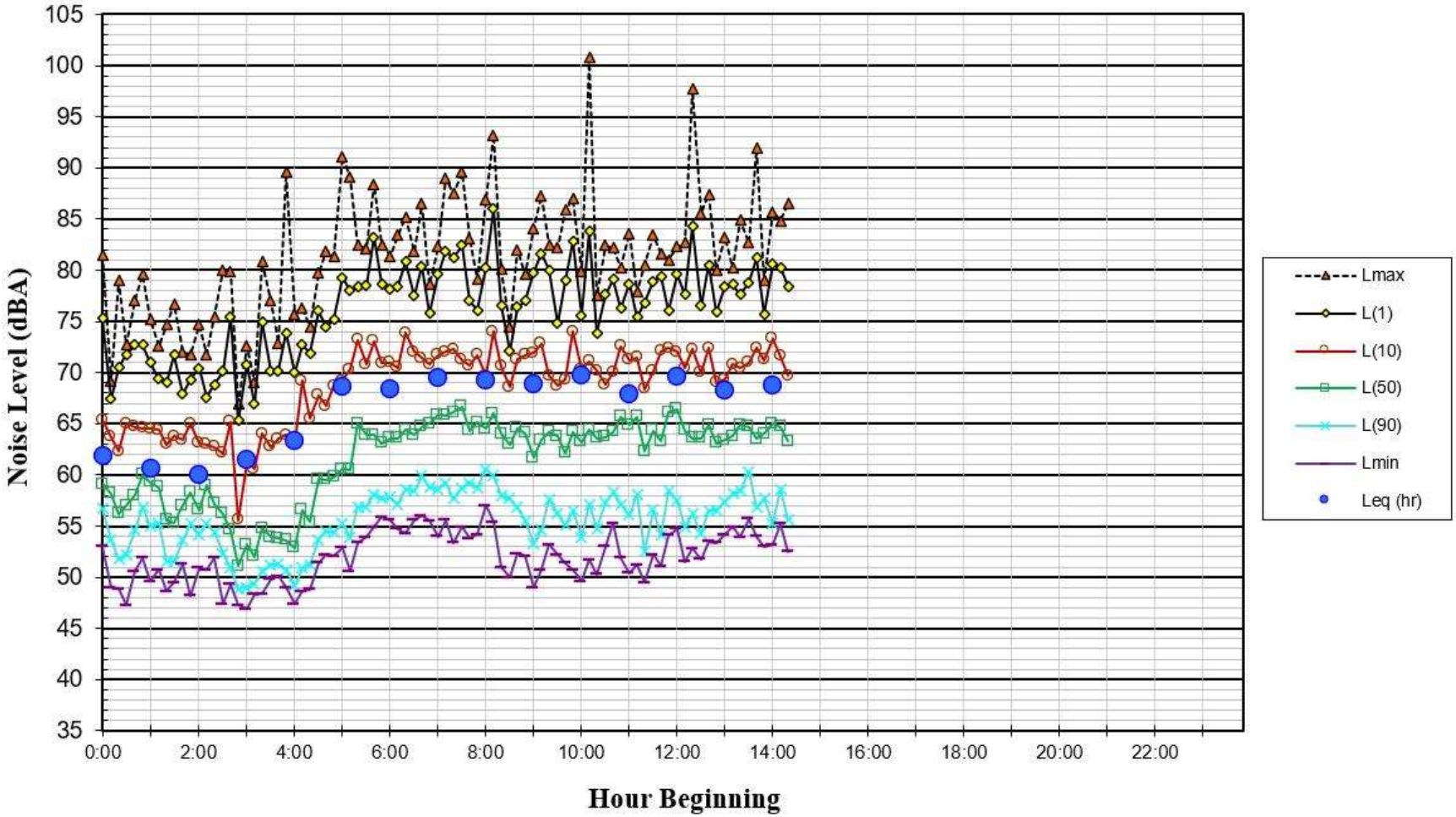


FIGURE A17 Daily Trend in Noise Levels at LT-6, Tuesday, September 17, 2019

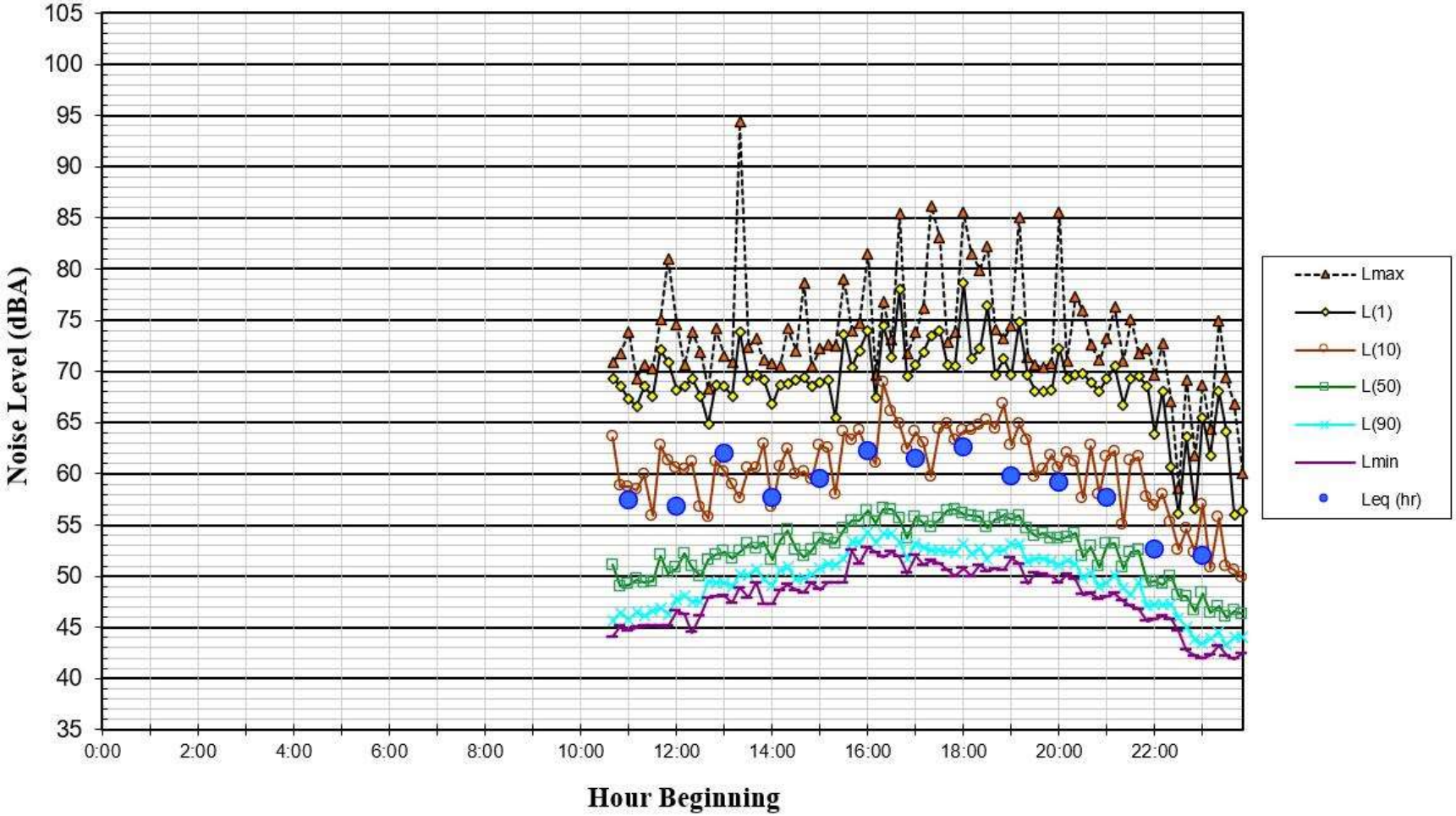


FIGURE A18 Daily Trend in Noise Levels at LT-6, Wednesday, September 18, 2019

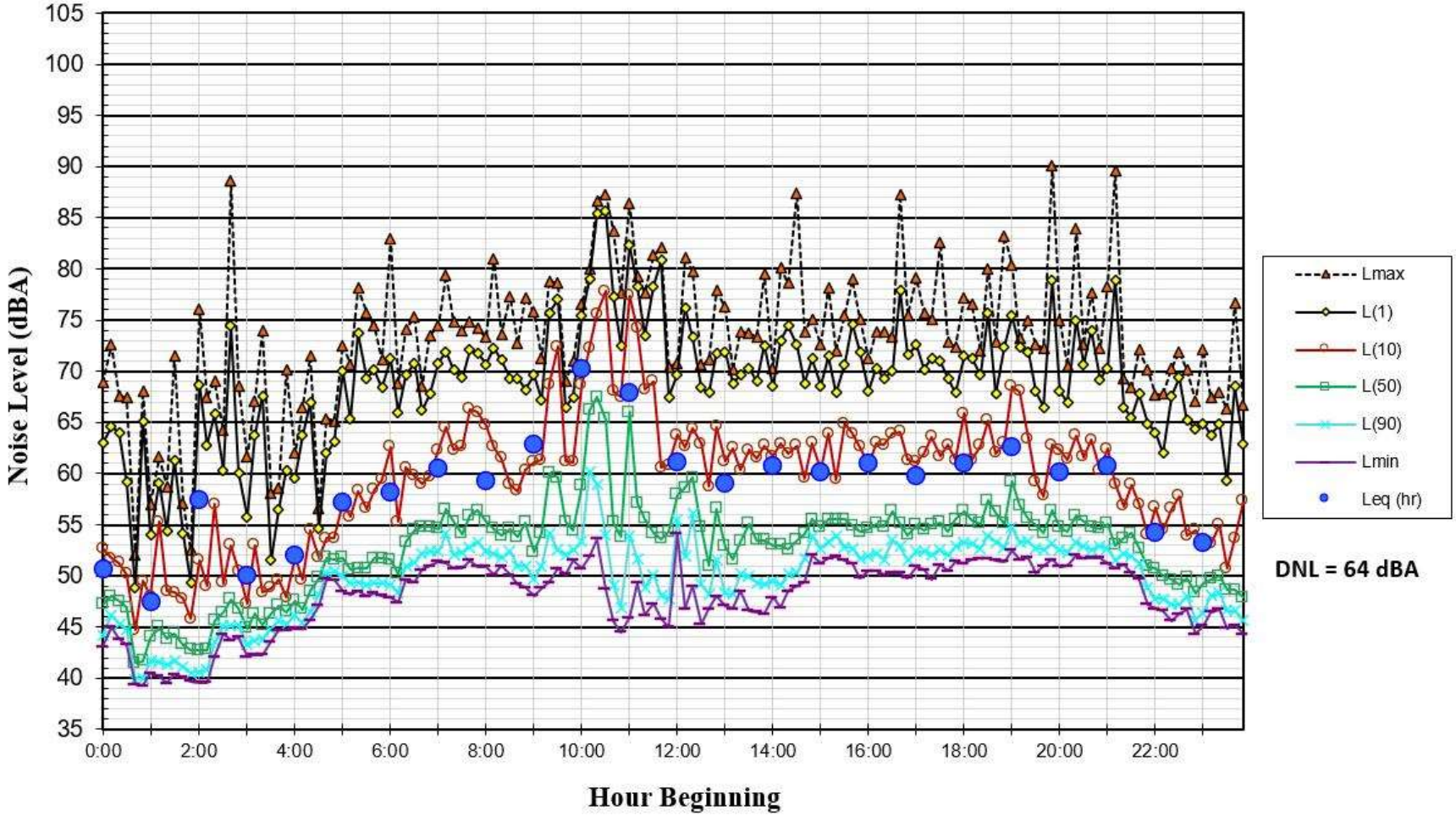


FIGURE A19 Daily Trend in Noise Levels at LT-6, Thursday, September 19, 2019

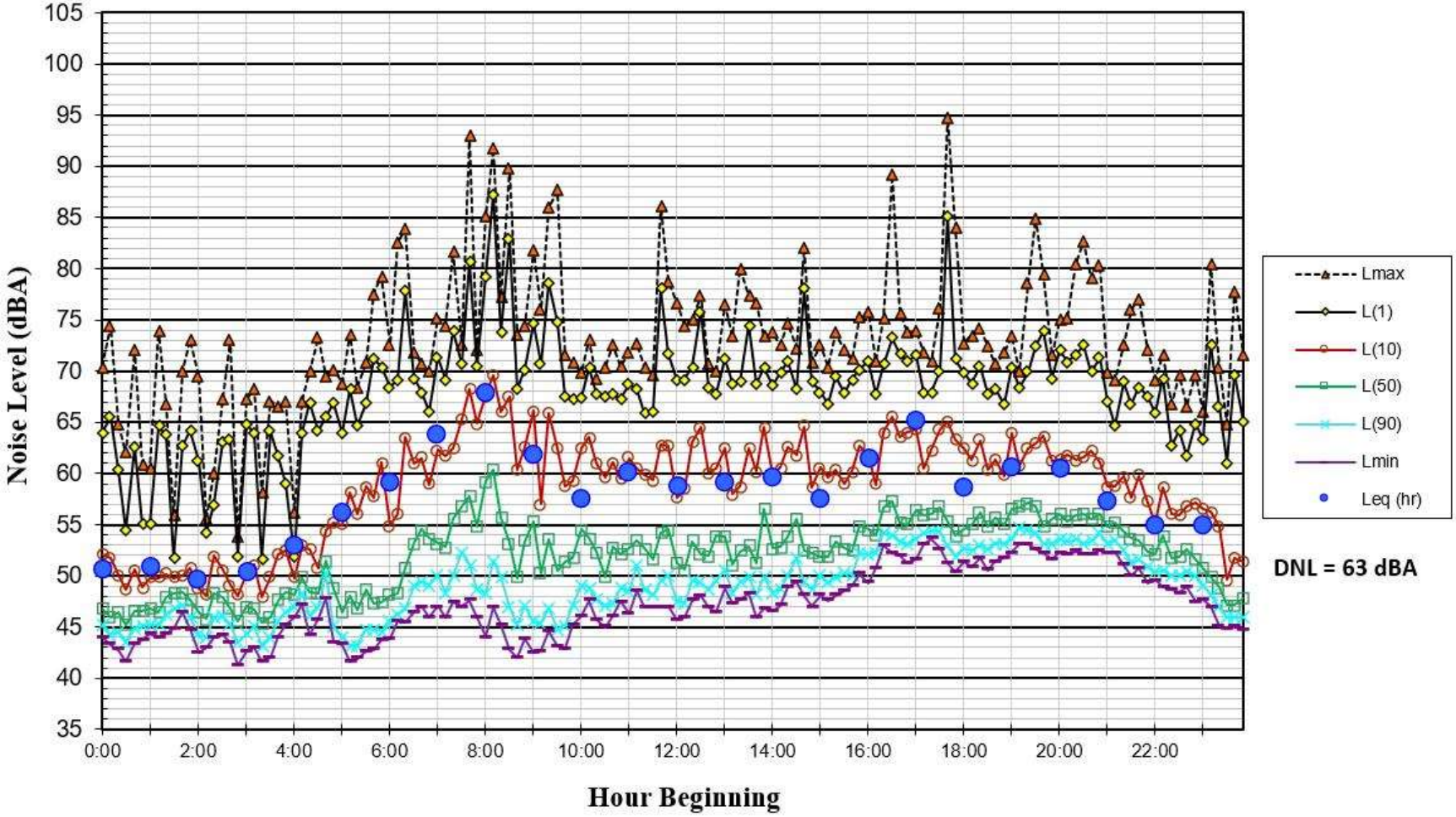


FIGURE A20 Daily Trend in Noise Levels at LT-6, Friday, September 20, 2019

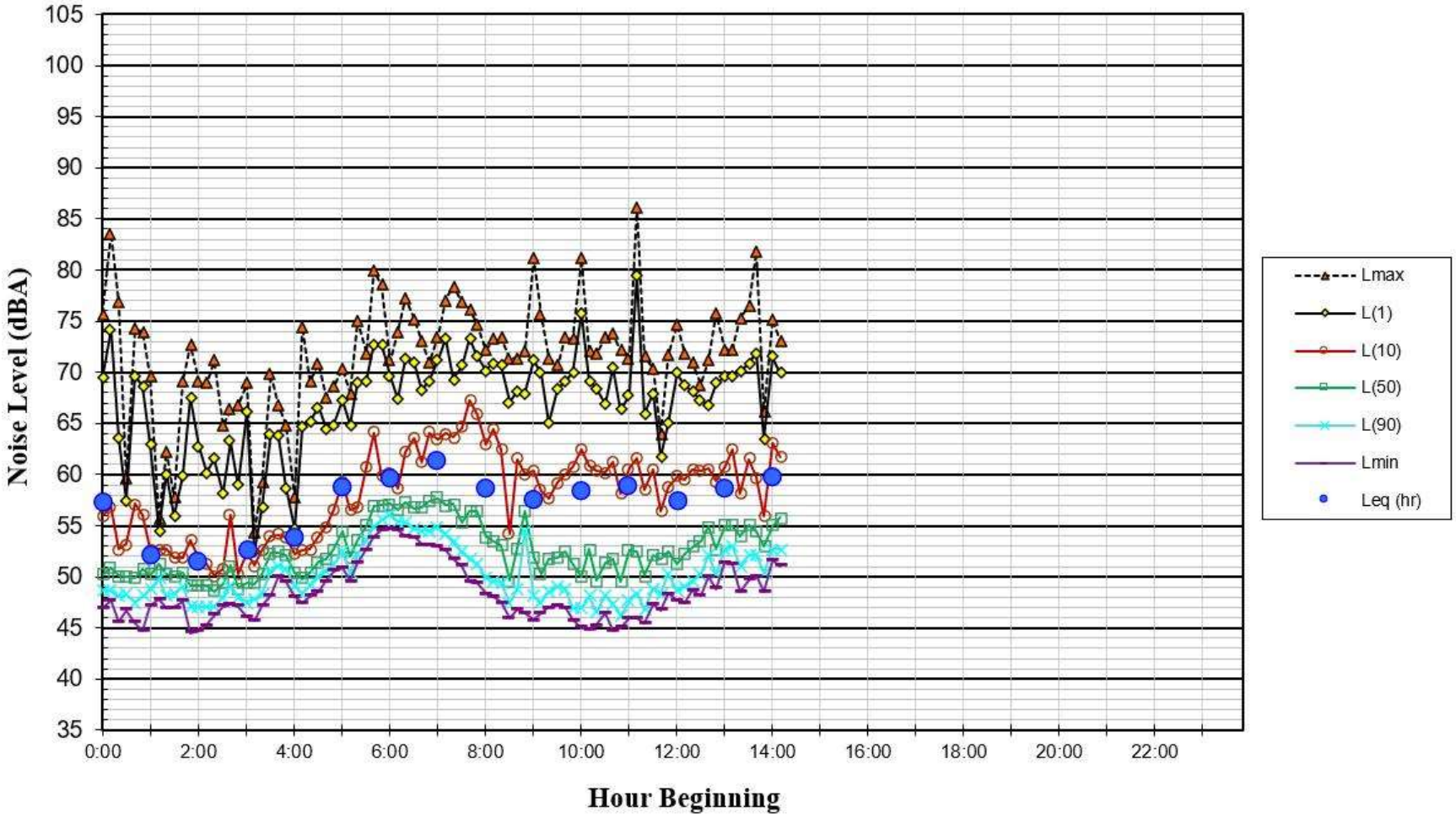


FIGURE A21 Daily Trend in Noise Levels at LT-7 on Tuesday, October 4, 2022

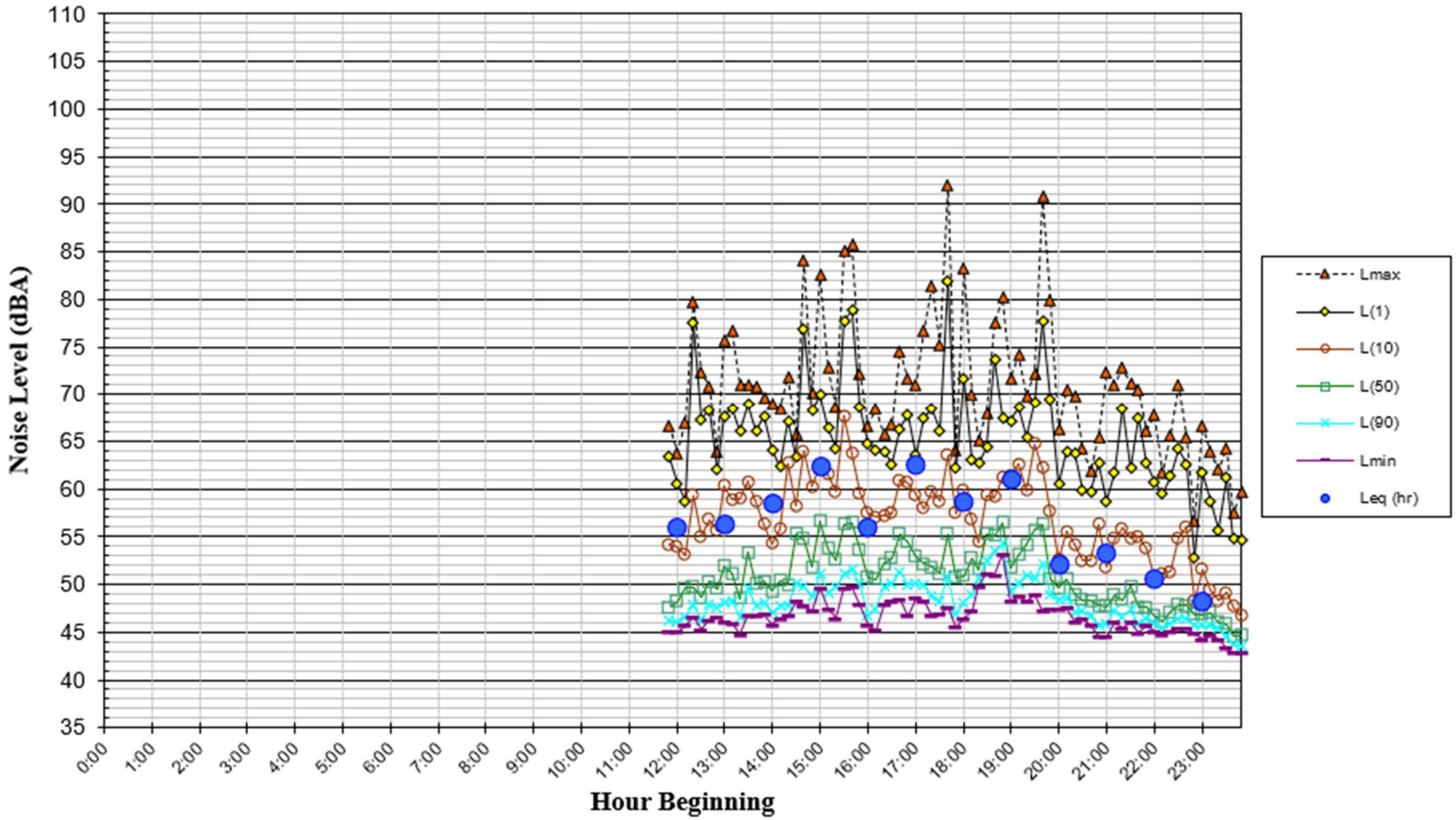


FIGURE A22 Daily Trend in Noise Levels at LT-7 on Wednesday, October 5, 2022

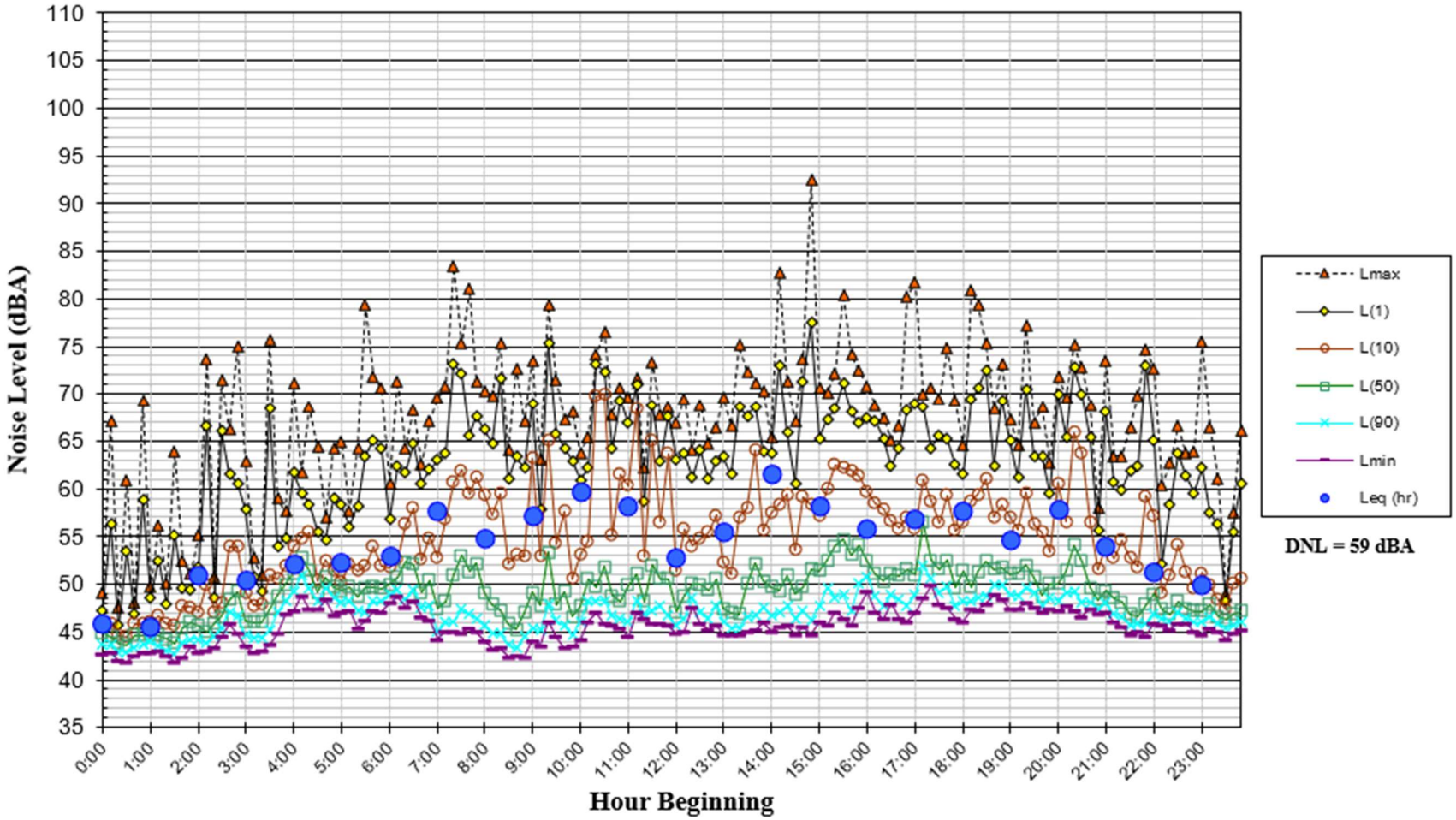


FIGURE A23 Daily Trend in Noise Levels at LT-7 on Thursday, October 6, 2022

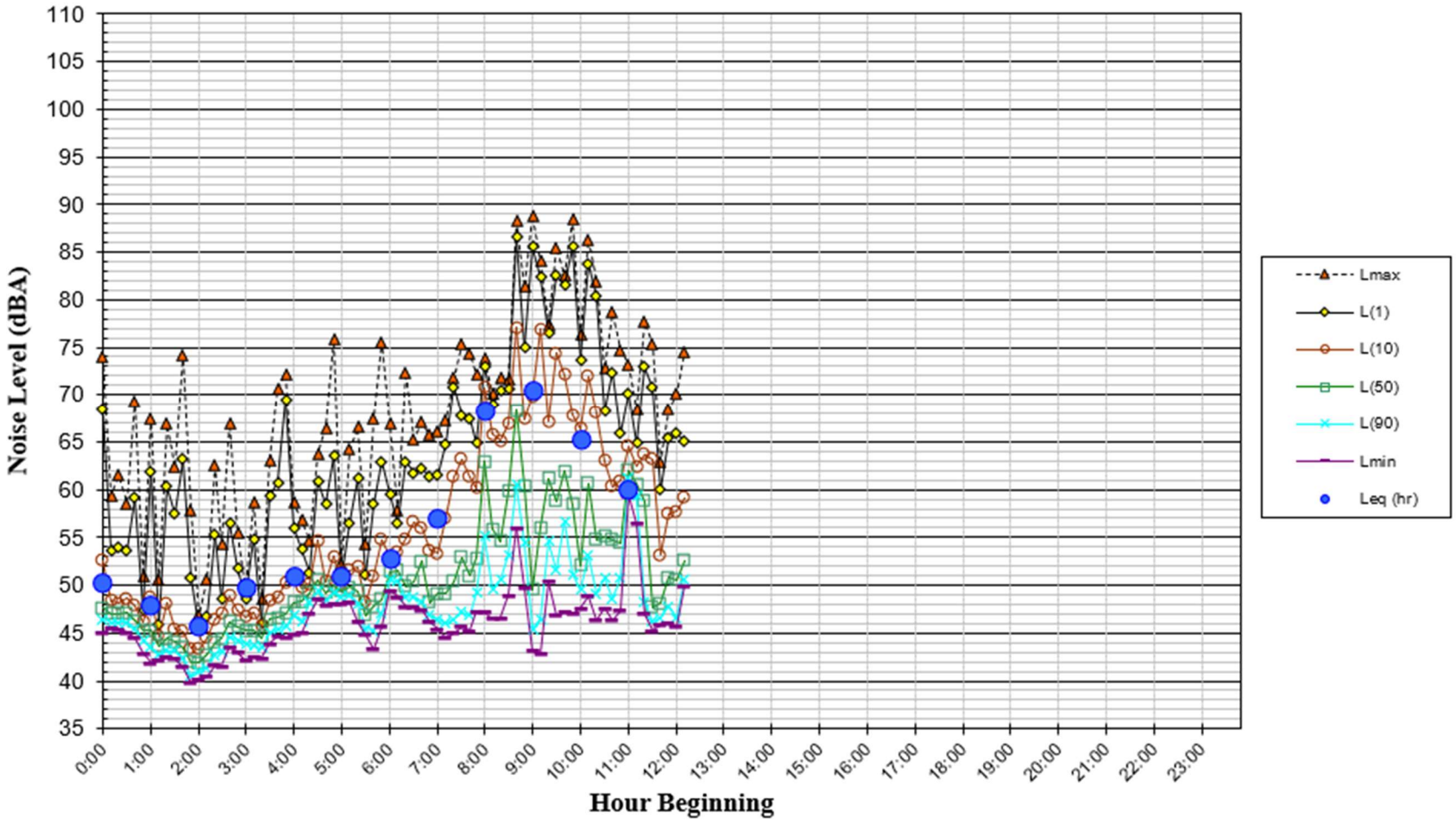


FIGURE A24 Daily Trend in Noise Levels at LT-8 on Tuesday, October 4, 2022

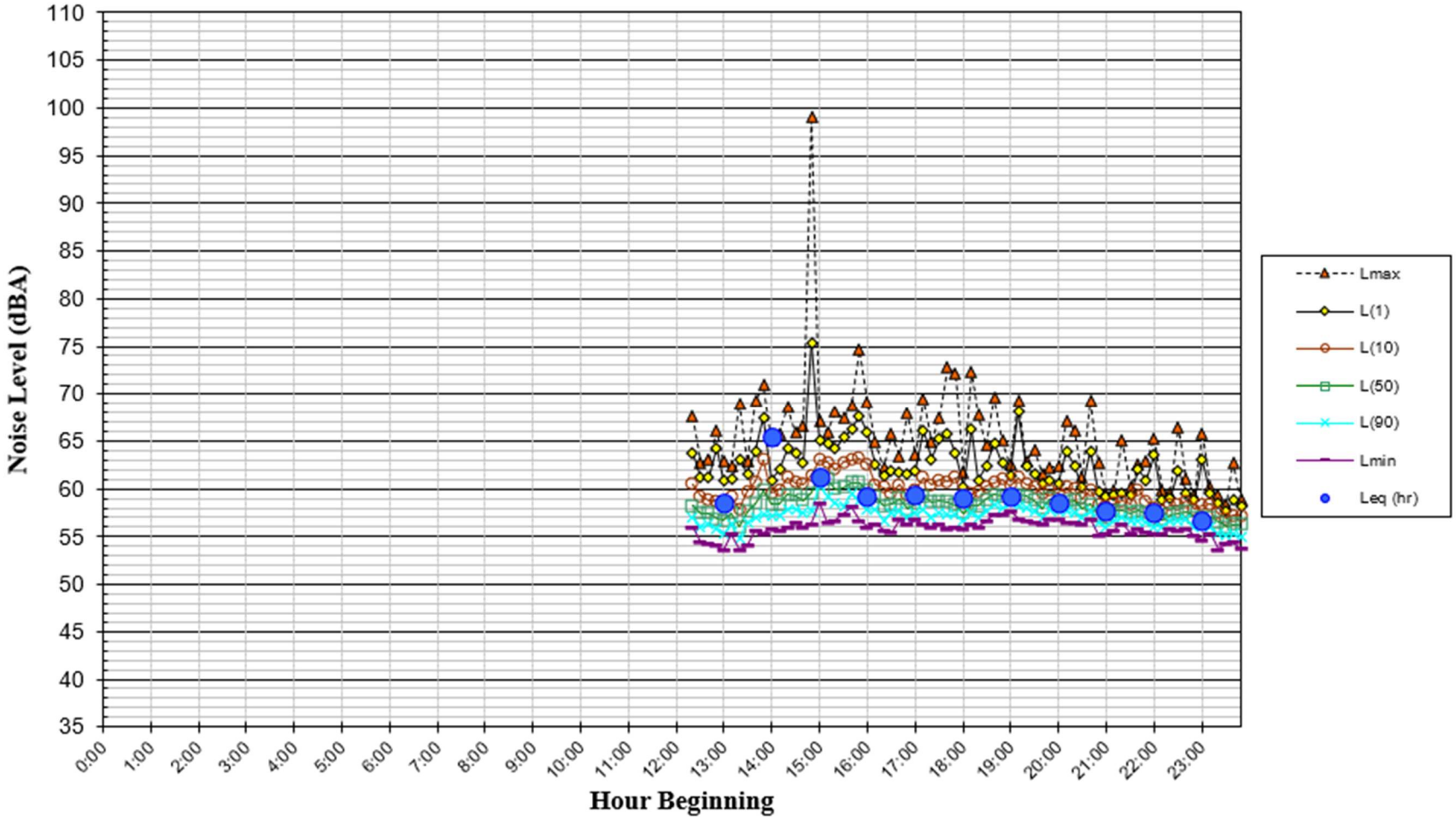


FIGURE A25 Daily Trend in Noise Levels at LT-8 on Wednesday, October 5, 2022

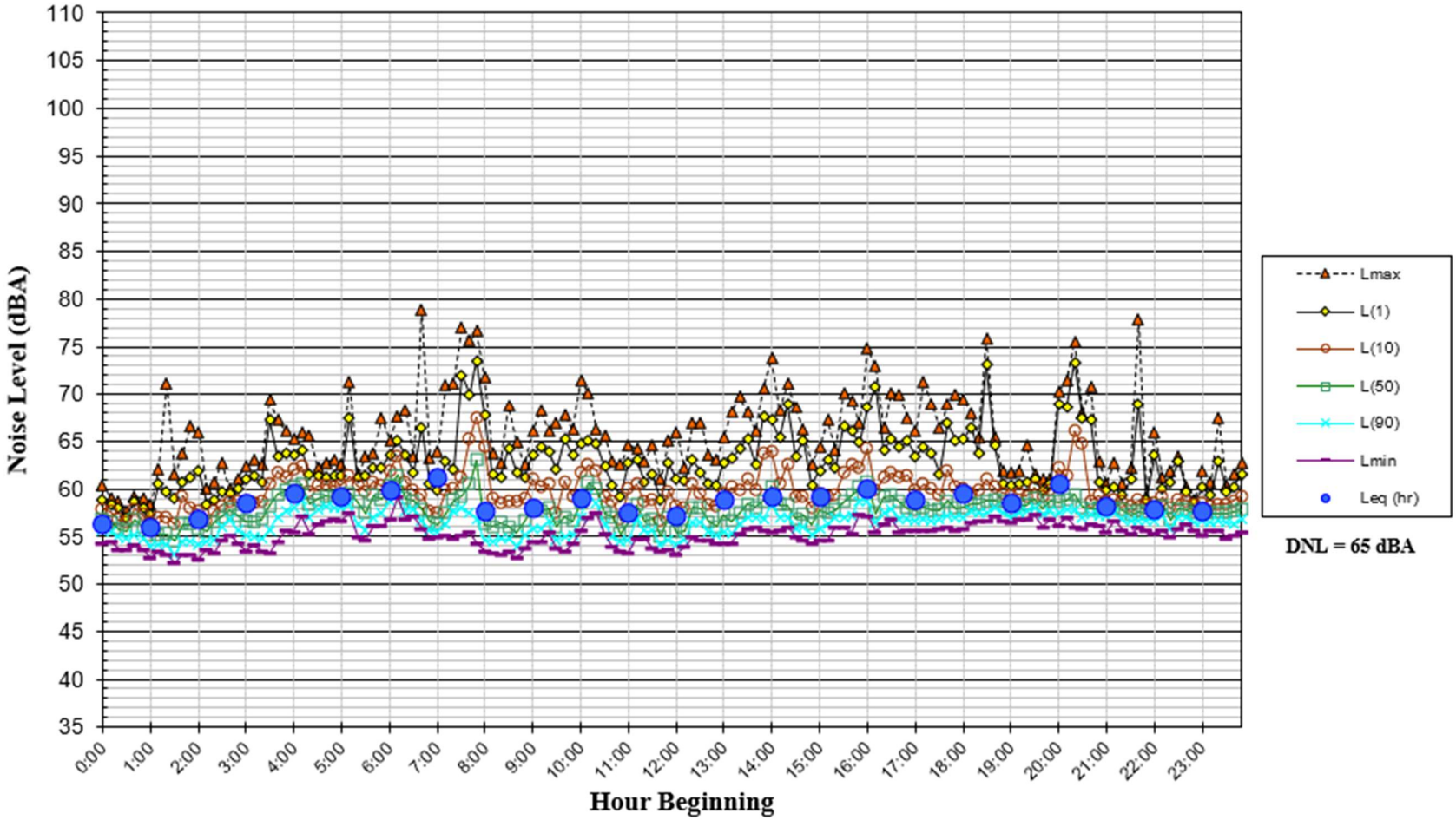


FIGURE A26 Daily Trend in Noise Levels at LT-8 on Thursday, October 6, 2022

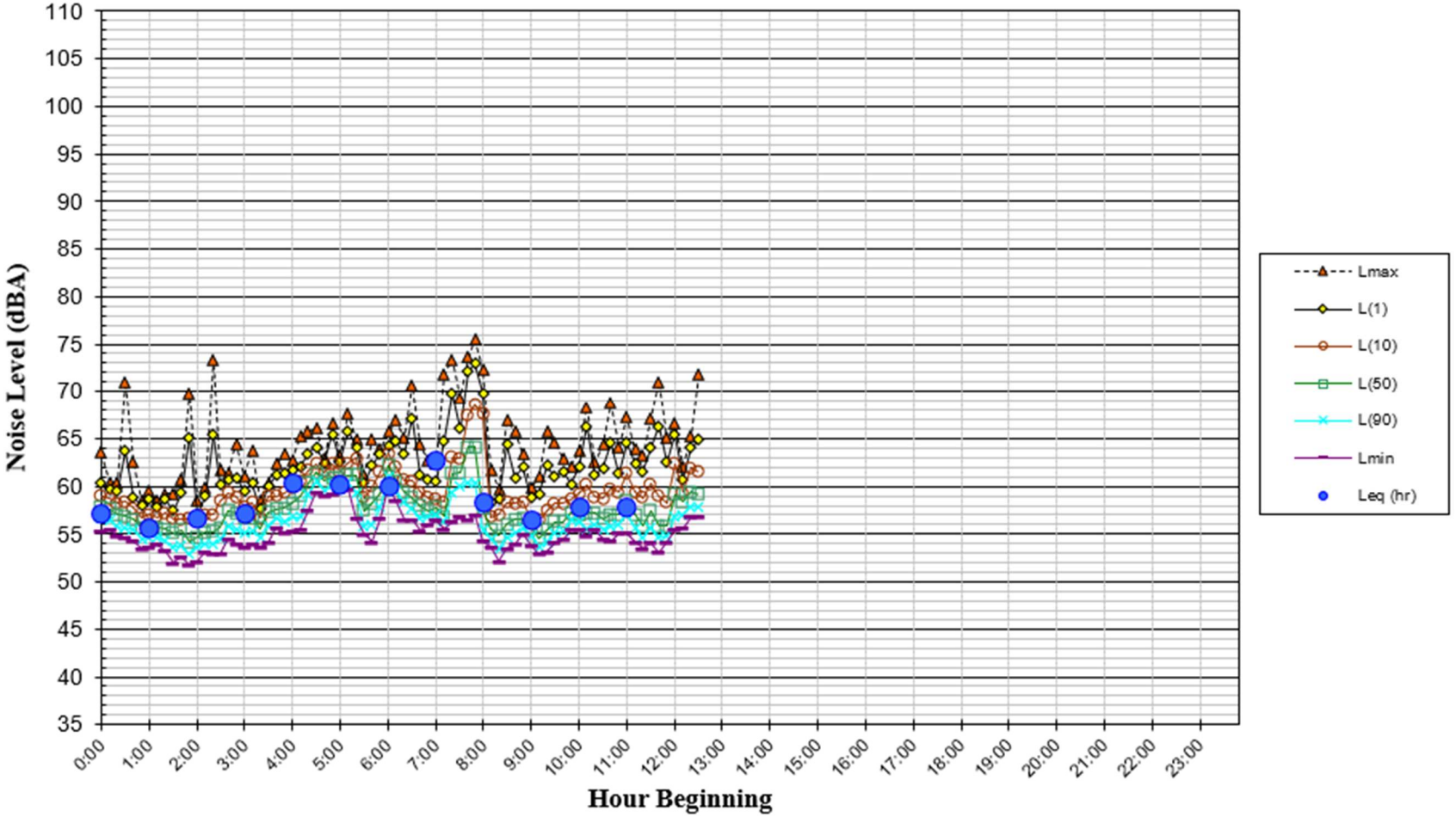


FIGURE A27 Daily Trend in Noise Levels at LT-9 on Tuesday, October 4, 2022

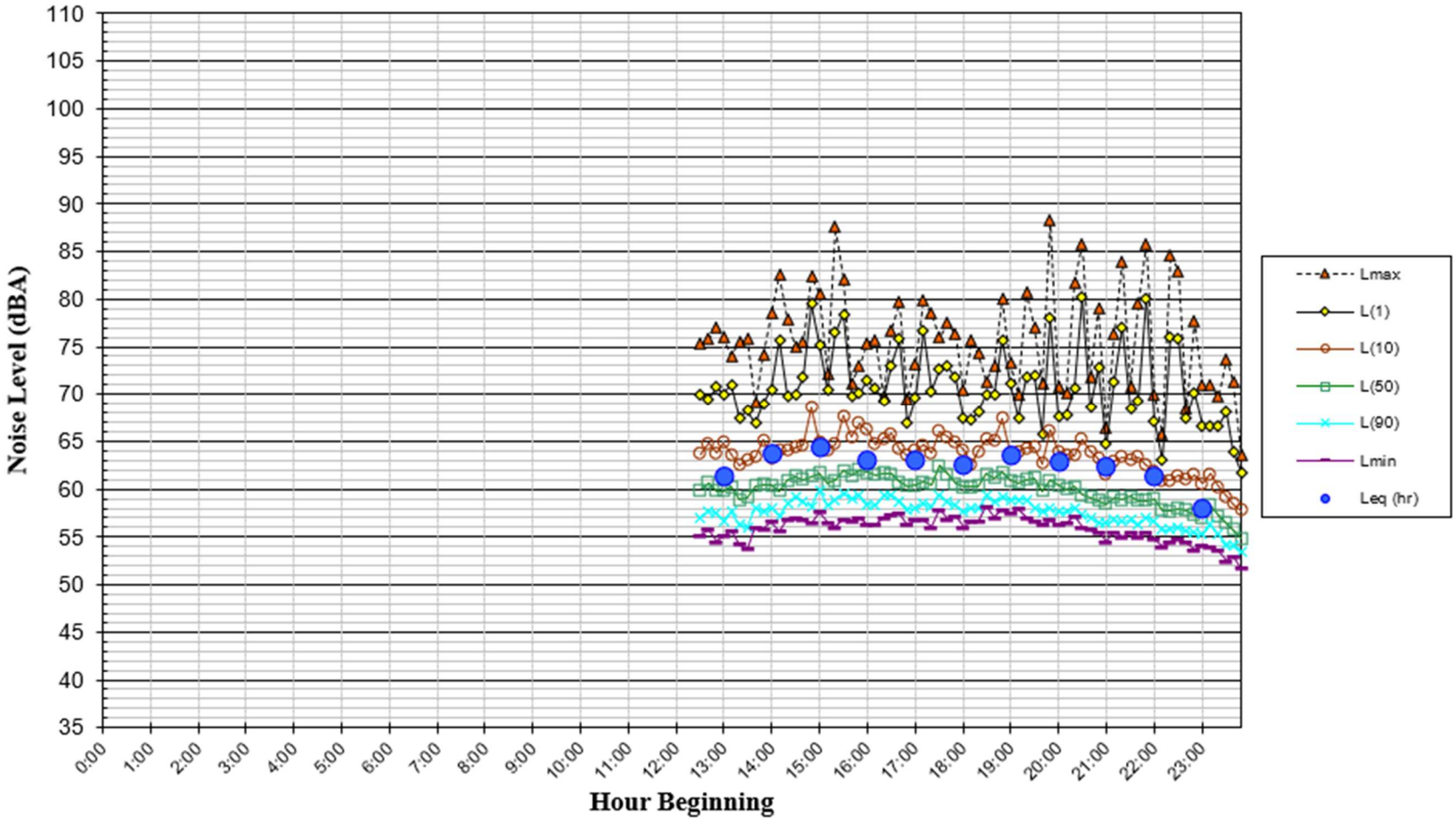


FIGURE A28 Daily Trend in Noise Levels at LT-9 on Wednesday, October 5, 2022

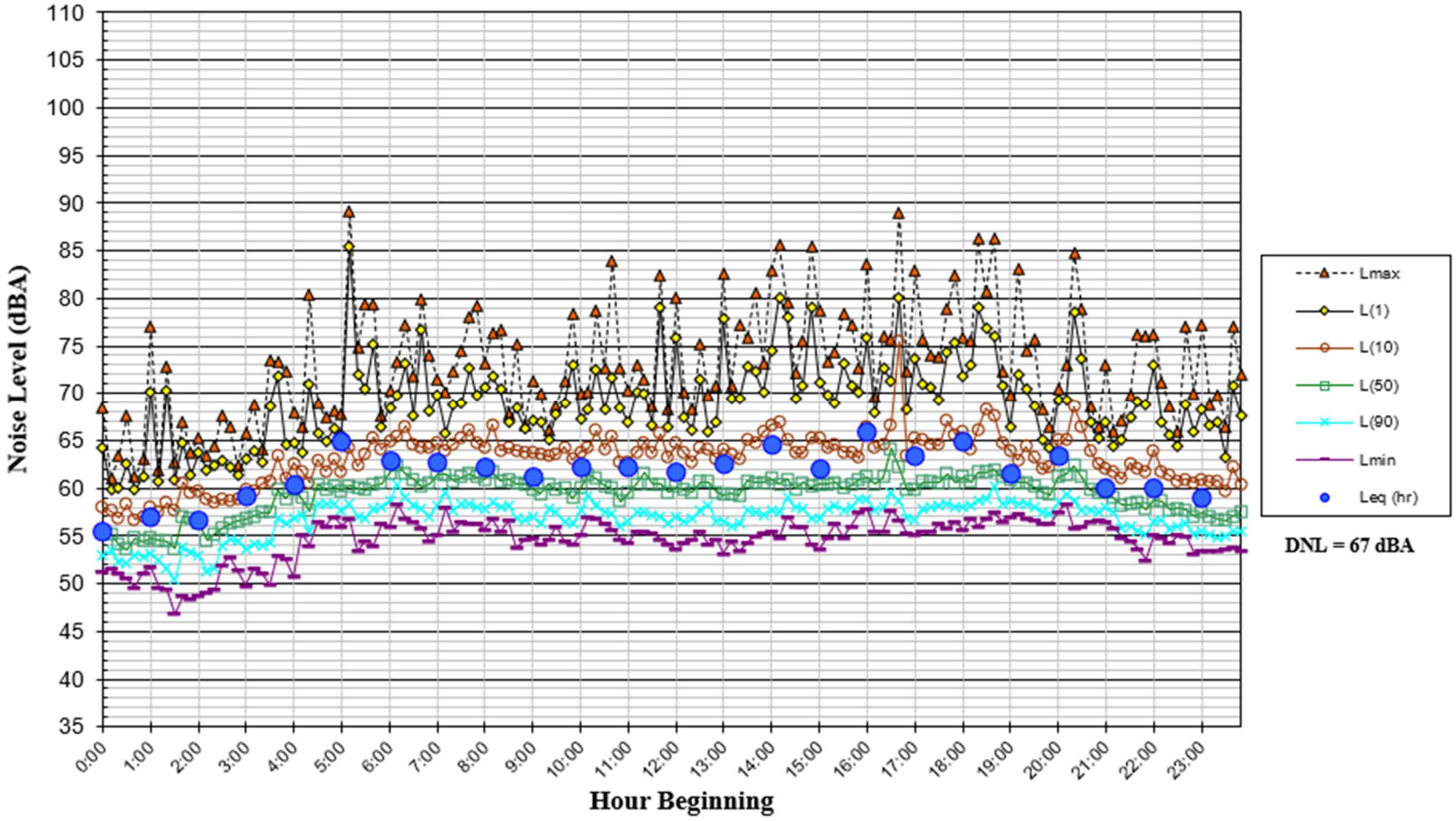


FIGURE A29 Daily Trend in Noise Levels at LT-9 on Thursday, October 6, 2022

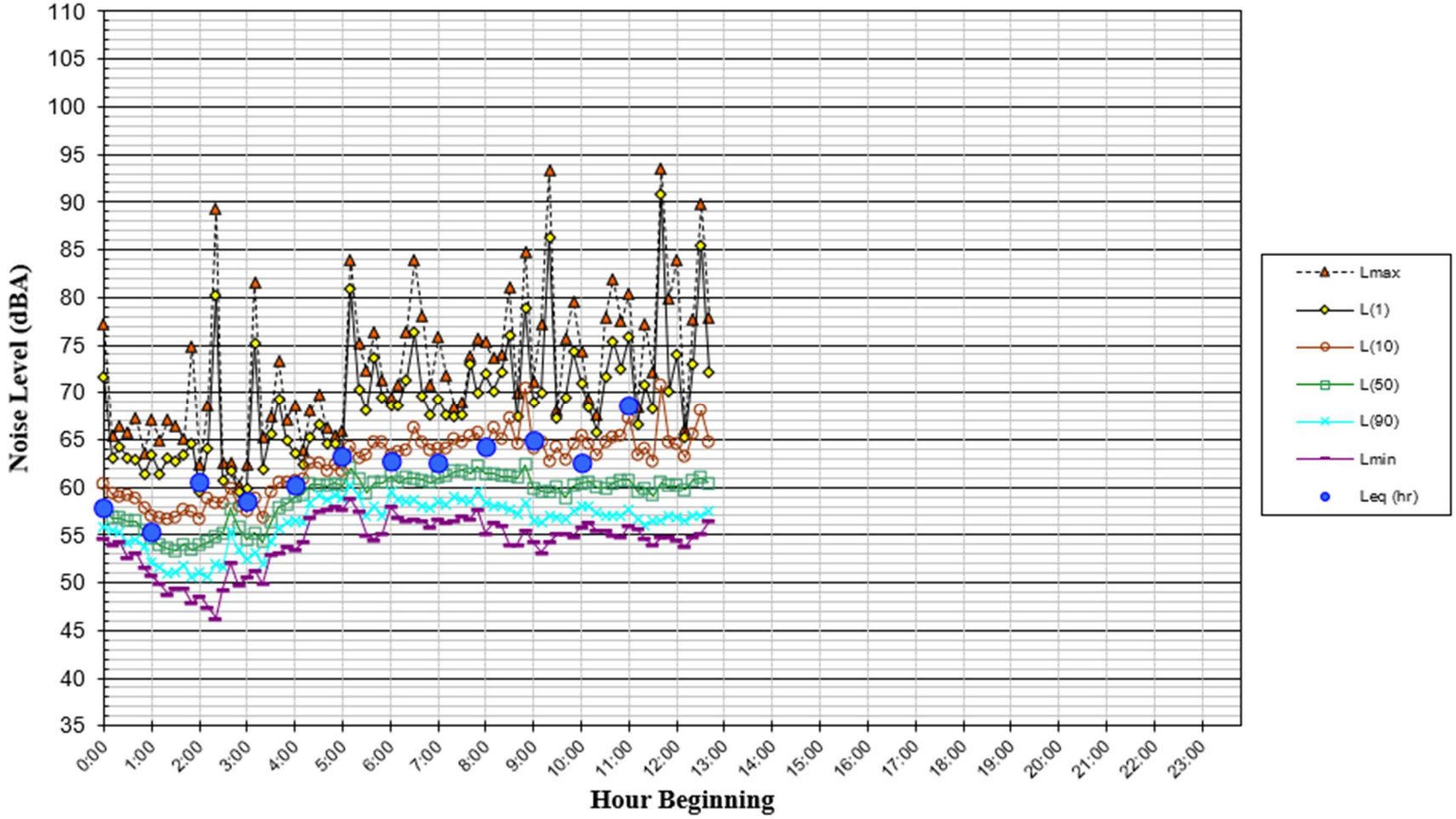


FIGURE A30 Daily Trend in Noise Levels at LT-10, Wednesday, March 15, 2023

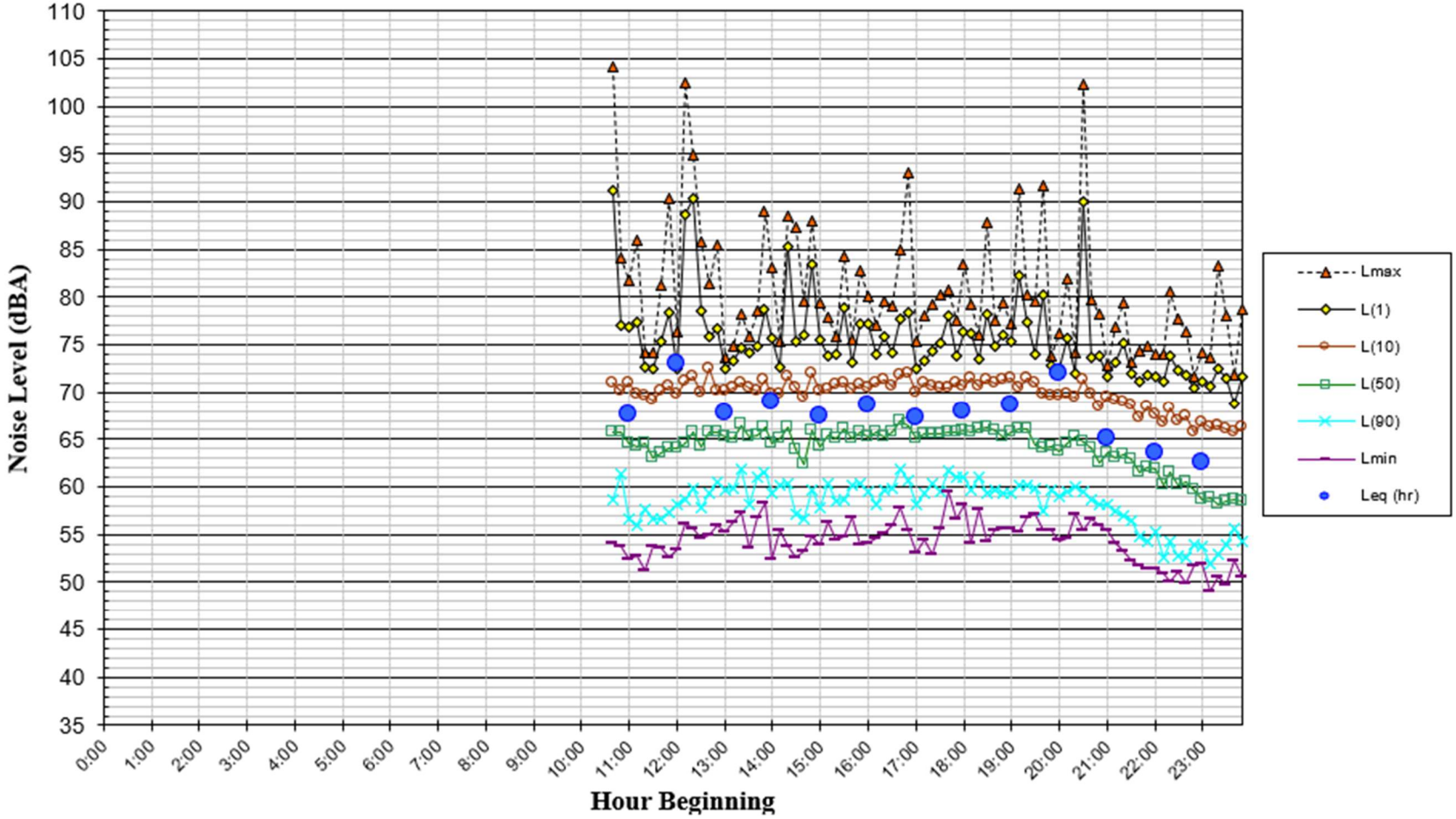


FIGURE A31 Daily Trend in Noise Levels at LT-10, Thursday, March 16, 2023

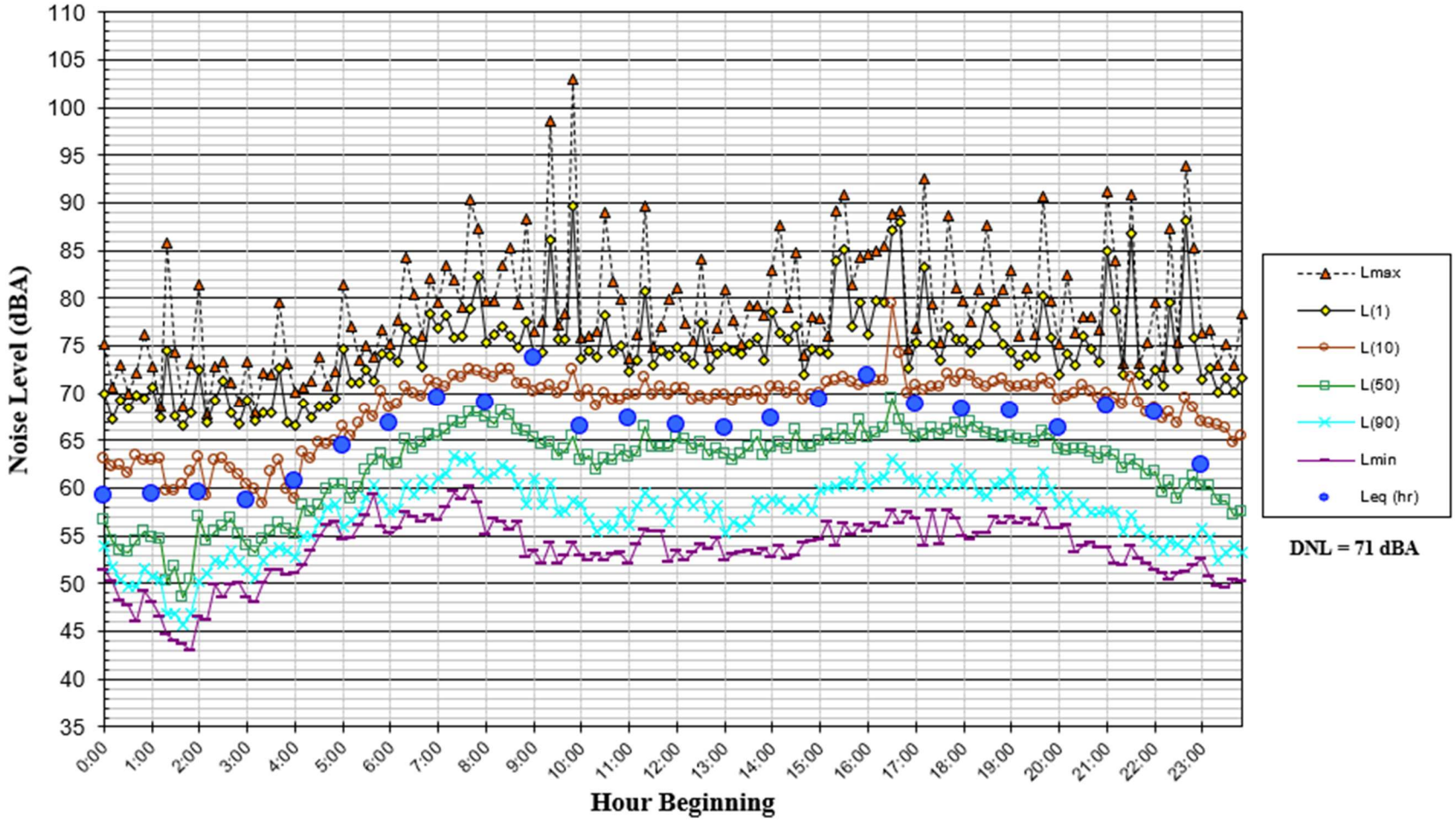


FIGURE A32 Daily Trend in Noise Levels at LT-10, Friday, March 17, 2023

