EAST WHISMAN PRECISE PLAN NOISE AND VIBRATION ASSESSMENT

Mountain View, California

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INTRODUCTION

The approximately 368-acre East Whisman Precise Plan Area is located along the eastern edge of the City of Mountain View, in northern Santa Clara County. The area is bounded by U.S. Highway 101 (U.S. 101) and Moffett Federal Airfield/NASA Ames Research Center to the north, Sunnyvale City Limits to the east, Central Expressway, South Whisman, and Whisman Station Precise Plan area to the south, and Whisman Road to the west.

The Precise Plan replaces district-specific regulations contained in the Mountain View City Code (Chapter 36, Zoning Ordinance) and several existing Planned Community Districts. The City adopted a new General Plan in 2012 to guide land use and growth in Mountain View through 2030. One of the "change areas" identified in the General Plan is the East Whisman area. For this area, the General Plan put forth a vision for a transit-oriented employment center with high-intensity office development, a greater diversity of land uses, an improved multimodal transportation network with safe pedestrian and bicycle connections, and expanded retail/services to support residents and workers in the area. The General Plan also identified the need to update the area's zoning and development standards through a precise plan process.

This report evaluates the project's potential to result in significant noise and vibration impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines on a program-level. The report is divided into three sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions; 2) the General Plan Consistency Section discusses noise and land use compatibility, utilizing policies in the City's General Plan; and, 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts upon sensitive receptors, provides a discussion of each project impact, and presents measures, where necessary, 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 intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in

acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

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

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

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

Effects of Noise

Sensitive Receptors

Some land uses are more sensitive to environmental noise than others due to the types of activities that occur and the degree of insulation from the noise. Typically, residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks for passive use are more sensitive than offices, retail, and industrial uses. Consequently, the noise standards for sensitive land uses are more stringent than those at less sensitive uses.

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural

hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration's (OSHA) noise exposure standard is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

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 noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. Interior residential standards for dwellings are set at 45 dBA L_{dn} by the State of California.

Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources.

When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 55 dBA L_{dn}. At an L_{dn} of about 60 dBA, approximately two percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about twelve percent of the population. There is, therefore, an increase of about one percent per decibel between an L_{dn} of 60 to 70 dBA. Between an L_{dn} of 70 to 80 dBA, each decibel increase increases the percentage of the population that is highly annoyed by about two percent.

People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately ten percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about two percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a three percent increase in the percentage of the population highly annoyed.

Fundamentals of Groundborne Vibration

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

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

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

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

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

Railroad and light-rail 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 velocity of the ground. The velocity of the

ground is expressed on the decibel scale. The reference velocity is 1 x 10^{-6} in/sec RMS, which 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 decibels to reduce the potential for confusion with sound decibels.

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

TABLE 1 Definition of Acoustical Terms Used in this Report

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

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

TABLE 2 Typical Noise Levels in the Environment

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

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

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

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

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

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, U.S. Department of Transportation Federal Transit Administration, May 2006.

Regulatory Background - Noise

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by the State of California, Santa Clara County, and the City of Mountain View. These documents are implemented during the environmental review process to limit noise exposure at existing and proposed noise sensitive land uses. Applicable planning documents include: (1) the CEQA Guidelines, Appendix G, (2) the Santa Clara County Airport Land Use Commission (ALUC) Airport Land Use Plan, (3) the City of Mountain View 2030 General Plan, and (4) the City of Mountain View City Code. Regulations, plans, and policies presented within these documents form the basis of the significance criteria used to assess project impacts.

State CEQA Guidelines. The CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. CEQA asks the following applicable questions. Would the project result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?

- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

- For a project located within 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, exposure of people residing or working in the project area to excessive noise levels?

- For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels?

Santa Clara County Airport Land Use Commission Airport Land Use Plan. The Santa Clara County Airport Land Use Commission prepares an Airport Land Use Plan that provides for orderly growth of the area surrounding each public airport in Santa Clara County (Moffett Federal Airfield, San Jose International Airport, Palo Alto Airport, Reid-Hillview Airport, and South County Airport). The Plan is intended to minimize the public's exposure to excessive noise and safety hazards. The ALUC has established provisions for regulating land use, building height, safety and noise insulation within these areas that are adjacent to each of the airports ("referral boundaries"). The ALUC also reviews the general and specific plans prepared by local agencies (including Mountain View) for consistency with the ALUC plan. Recommendations made by the ALUC are advisory in nature to the local jurisdictions, not mandatory. The following from the adopted Plan for Moffett Federal Airfield are applicable:

4.3.2 Noise Compatibility

The objective of noise compatibility criteria is to minimize the number of people exposed to frequent and/or high levels of aircraft noise.

4.3.2.1 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 Guidelines presented in Table 4-1 (Chart 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 (see Figure 8 of 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 of 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 65 dB CNEL contour boundary 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 Residential construction will not be permitted in the area between the 60 dB CNEL contour boundary and the 65 dB CNEL contour boundary unless it can be demonstrated that the resulting interior sound level will be no greater than 45 dB CNEL.

N-7 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 (Chart 1) presents acceptable noise levels for other land uses in the vicinity of the Airport.

N-8 Single-event noise levels (SENL) from single aircraft overflights are 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.

CHART 1 Outdoor Noise Environment Guidelines – Santa Clara County ALUC Moffett Federal Airfield Land Use Plan

Table 4 - 1

NOISE COMPATIBILITY POLICIES

Moffett Federal Airfield

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 should 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

4.3.6 Overflight

The objective of the overflight compatibility criteria is to assist those persons who are highly annoyed by overflights or have an above-average sensitivity to aircraft overflights to avoid living in locations where these impacts may occur.

4.3.6.1 Policies

O-1 All new projects within the AIA that are subject to discretionary review and approval shall be required to dedicate an avigation easement to the County of Santa Clara. The avigation easement shall be similar to that shown as Exhibit 1 in Appendix A.
(In September of 2002 Assembly Bill AB2776 was signed into law and is to become effective on January 1, 2004. This statute requires that as part of the real estate transfer process, the purchaser be informed if the property is in an Airport Influence Area and if so, the purchaser is to be informed of the potential impacts resulting from the associated airport.)

City of Mountain View 2030 General Plan. Chapter 7 of the City of Mountain View 2030 General Plan establishes the following Goals and Policies that would be applicable to the proposed project:

Goal NOI-1: Noise levels that support a high quality of life in Mountain View.

> POLICY NOI 1.1: Land Use Compatibility. Use the Outdoor Noise Acceptability Guidelines as a guide for planning and development decisions.
>
> POLICY NOI 1.2: Noise-sensitive land uses. Require new development of noise-sensitive land uses to incorporate measures into the project design to reduce interior and exterior noise levels to the following acceptable levels:
>
> - New single-family developments shall maintain a standard of 65 dBA L_{dn} for exterior noise in private outdoor active use areas.
>
> - New multi-family residential developments shall maintain a standard of 65 dBA L_{dn} for private and community outdoor recreation use areas. Noise standards do not apply to private decks and balconies in multi-family residential developments.
>
> - Interior noise levels shall not exceed 45 dBA L_{dn} in all new single-family and multifamily residential units.
>
> - Where new single-family and multi-family residential units would be exposed to intermittent noise from major transportation sources such as train or airport operations, new construction shall achieve an interior noise level of 65 dBA (L_{max}) through measures such as site design or special construction materials. This standard shall apply to areas exposed to four or more major transportation noise events such as passing trains or aircraft flyovers per day.

POLICY NOI 1.3: Exceeding acceptable noise thresholds. If noise levels in the area of a proposed project would exceed normally acceptable thresholds, the City shall require a detailed analysis of proposed noise reduction requirements to determine whether the proposed use is compatible. As needed, noise insulation features shall be included in the design of such projects to reduce exterior noise levels to meet acceptable thresholds, or for uses with no active outdoor use areas, to ensure acceptable interior noise levels.

> Note: Table 7.1 from the General Plan (Chart 2) provides general guidance, and establishes acceptable noise thresholds, for siting new land uses given future noise exposure levels. Policies NOI 1.1 and NOI 1.2 contain specific standards for noise levels in residential developments.

POLICY NOI 1.4: Site planning. Use site planning and project design strategies to achieve the noise level standards in NOI 1.1 (Land Use Compatibility) and in NOI 1.2 (Noise Sensitive Land Uses). The use of noise barriers shall be considered after all practical design-related noise measures have been integrated into the project design.

POLICY NOI 1.5: Reduce the noise impacts from major arterials and freeways.

POLICY NOI 1.6: Sensitive uses. Minimize noise impacts on noise-sensitive land uses, such as residential uses, schools, hospitals and child-care facilities.

POLICY NOI 1.7: Stationary sources. Restrict noise levels from stationary sources through enforcement of the Noise Ordinance.

POLICY NOI 1.8: Moffett Federal Airfield. Support efforts to minimize noise impacts from Moffett Federal Airfield in coordination with Santa Clara County's Comprehensive Land Use Plan.

POLICY NOI 1.9: Rail. Reduce the effects of noise and vibration impacts from rail corridors.

CHART 2 Outdoor Noise Environment Guidelines – City of Mountain View 2030 General Plan

Table 7.1 Outdoor Noise Environment Guidelines

Land Use Category	Community Noise Exposure in Decibels (CNEL) Day/Night Average Noise Level in Decibels (Ldn)						
	55	60	65	70	75	80	85
Residential–Single-Family, Duplex, Mobile Homes							
Residential–Multi-Family Transient Lodging–Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters, Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

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

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE
New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development clearly should not be undertaken.

Source: State of California General Plan Guidelines, 2003.

City of Mountain View Code. The City's Code provides provisions for construction hours and allowable noise levels for stationary equipment. The portions of the Code that are relevant for this project are as follows:

Section 8.70.1 Construction noise.

a. **Hours of construction**. No construction activity shall commence prior to 7:00 a.m. nor continue later than 6:00 p.m., Monday through Friday, nor shall any work be permitted on Saturday or Sunday or holidays unless prior written approval is granted by the building official. The term "construction activity" shall include any physical activity on the construction site or in the staging area, including the delivery of materials. In approving modified hours, the building official may specifically designate and/or limit the activities permitted during the modified hours.

b. **Modification.** At any time before commencement of or during construction activity, the building official may modify the permitted hours of construction upon twenty-four (24) hours written notice to the contractor, applicant, developer or owner. The building official can reduce the hours of construction activity below the 7:00 a.m. to 6:00 p.m. time frame or increase the allowable hours.

c. **Sign required.** If the hours of construction activity are modified, then the general contractor, applicant, developer or owner shall erect a sign at a prominent location on the construction site to advise subcontractors and material suppliers of the working hours. The contractor, owner or applicant shall immediately produce upon request any written order or permit from the building official pursuant to this section upon the request of any member of the public, the police or city staff.

d. **Violation.** Violation of the allowed hours of construction activity, the building official's order, required signage or this section shall be a violation of this code. (Ord. No. 13.10, § 15, 10/26/10)

Section 21.26 Stationary equipment noise.

a. No person shall own or operate on any property any stationary equipment, such as, but not limited to, air compressors, equipment for swimming pools, spas, or air conditioners, which produces a sound level exceeding 55 dBA (50 dBA during the night, 10 p.m. to 7 a.m.) when measured at any location on any receiving residentially used property, said measurement to utilize a sound level meter equal to or better than an ANSI Standard S 1.4-1971 Type 2 noise level meter.

b. Any plans submitted for building, plumbing, electrical or mechanical/heating permit for any stationary equipment shall be accompanied by documentation of the equipment noise level when available and by noise mitigating devices or buffers appropriate to achieve the above noise limit. Initial granting of a permit for such equipment shall not affect the obligation of each person owning or operating such equipment for continued compliance with these noise level requirements.

c. Operation of any equipment, as specified in this section, above the 55 dBA limit (50 dBA nighttime), may occur only if the owner or operator has obtained a conditional use permit. A permit to operate equipment which exceeds the limit may be granted by the zoning administrator only if it has been demonstrated that such operation will not be detrimental to the health, safety, peace, morals, comfort or general welfare of residents subjected to such noise. The manner of obtaining said permit and the rules governing its issuance and revocation shall be as specified in Mountain View City Code Sec. 36.43 and following, all relating to the issuance of conditional use permits. (Ord. No. 11.81, 8/31/81)

Regulatory Criteria – Vibration

The City of Mountain View has not identified quantifiable vibration limits that can be used to evaluate the compatibility of land uses with vibration levels experienced at a project site. Although there are no local standards that control the allowable vibration in a new residential development, the U.S. Department of Transportation has developed vibration impact assessment criteria for evaluating vibration impacts associated with transit projects.[1] The Federal Transit Administration (FTA) has proposed vibration impact criteria, based on maximum overall levels for a single event. The impact criteria for groundborne vibration are shown in Table 5. 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).

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

TABLE 5 Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 µinch/sec, RMS)		
	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

Notes:

1. "Frequent Events" is defined as more than 70 vibration events of the same source 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 of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.

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

Existing Noise Environment

The East Whisman Precise Plan area is located in the eastern end of the City of Mountain View, bounded by U.S. 101 and Moffett Federal Airfield to the north, the City of Sunnyvale to the east, Central Expressway, Caltrain, and the South Whisman Precise Plan Area to the south, and North Whisman Road to the west.

A noise monitoring survey was performed by *Illingworth & Rodkin, Inc. (I&R)* between Tuesday, November 15, 2016 and Thursday, November 17, 2016 in order to quantify existing ambient noise levels within and around the Precise Plan Area. The survey included four long-term noise measurements (LT-1 through LT-4) and nine short-term (10-minute) noise measurements (ST-1 through ST-9), as shown in Figure 1.

Based on the results of the ambient noise measurements, it was determined that transportation-related noise sources are the primary contributor to the noise environment in the Plan Area. Major transportation corridors that traverse the Plan Area include U.S. 101; arterial roadways, such as East Middlefield Road; and collector roadways, such as Whisman Road. Other contributors

include trains along the Santa Clara Valley Transportation Authority (VTA) light rail tracks that traverse the Plan Area and aircraft associated with the Moffett Federal Airfield.

Long-term noise measurement LT-1 was made in front of 599 Fairchild Drive, approximately 30 feet south of the Fairchild Drive centerline and approximately 160 feet south of the centerline of the nearest U.S. 101 through lane. This location was selected to quantify noise levels due to traffic along U.S. 101. Hourly average noise levels at this location ranged from 66 to 79 dBA L_{eq} during the day, and from 64 to 73 dBA L_{eq} at night. The day-night average noise level on Wednesday, November 16, 2016 was 76 dBA L_{dn}. The daily trend in noise levels at LT-1 is shown in Figure 2.

Long-term noise measurement LT-2 was made across Ellis Street from 500 East Middlefield Road, approximately 50 feet west of the Ellis Street centerline and approximately 140 feet north of the East Middlefield Road centerline. This location was selected to quantify noise levels due to traffic along East Middlefield Road and Ellis Street. Hourly average noise levels at this location ranged from 59 to 78 dBA L_{eq} during the day, and from 53 to 65 dBA L_{eq} at night. The day-night average noise level on Wednesday, November 16, 2016 was 70 dBA L_{dn}. The daily trend in noise levels at LT-2 is shown in Figure 3.

Long-term measurement site LT-3 was located along the Frontage Road southeast of State Route 237 (S.R. 237) in the section between East Middlefield Road and West Maude Avenue, approximately 45 feet southeast of the Frontage Road centerline and approximately 90 feet southeast of the centerline of the nearest S.R. 237 through-lane. This location was selected to quantify noise levels due to traffic along S.R. 237. Hourly average noise levels at this location ranged from 65 to 72 dBA L_{eq} during the day, and from 56 to 69 dBA L_{eq} at night. The day-night average noise level on Wednesday, November 16, 2016 was 72 dBA L_{dn}. The daily trend in noise levels at LT-3 is shown in Figure 4.

Long-term noise measurement LT-4 was made in the southern parking lot of 280 North Bernardo Avenue, approximately 90 feet north of the Central Expressway centerline and 190 feet north of the Caltrain tracks centerline. This location was selected to quantify noise levels due to traffic along Central Expressway. Hourly average noise levels at this location ranged from 67 to 74 dBA L_{eq} during the day, and from 58 to 72 dBA L_{eq} at night. The day-night average noise level on Wednesday, November 16, 2016 was 74 dBA L_{dn}. The daily trend in noise levels at LT-4 is shown in Figure 5.

Nine short-term noise measurements were made to complete the noise monitoring survey. The short-term noise measurements were made on the afternoons of Tuesday, November 15, 2016 and Thursday, November 17, 2016. The 10-minute average noise levels measured at these locations ranged from 45 to 70 dBA L_{eq} depending upon localized shielding features at the measurement locations and proximity of noise sources. Table 6 summarizes the results of these measurements.

FIGURE 1 East Whisman Precise Plan Noise Monitoring Locations

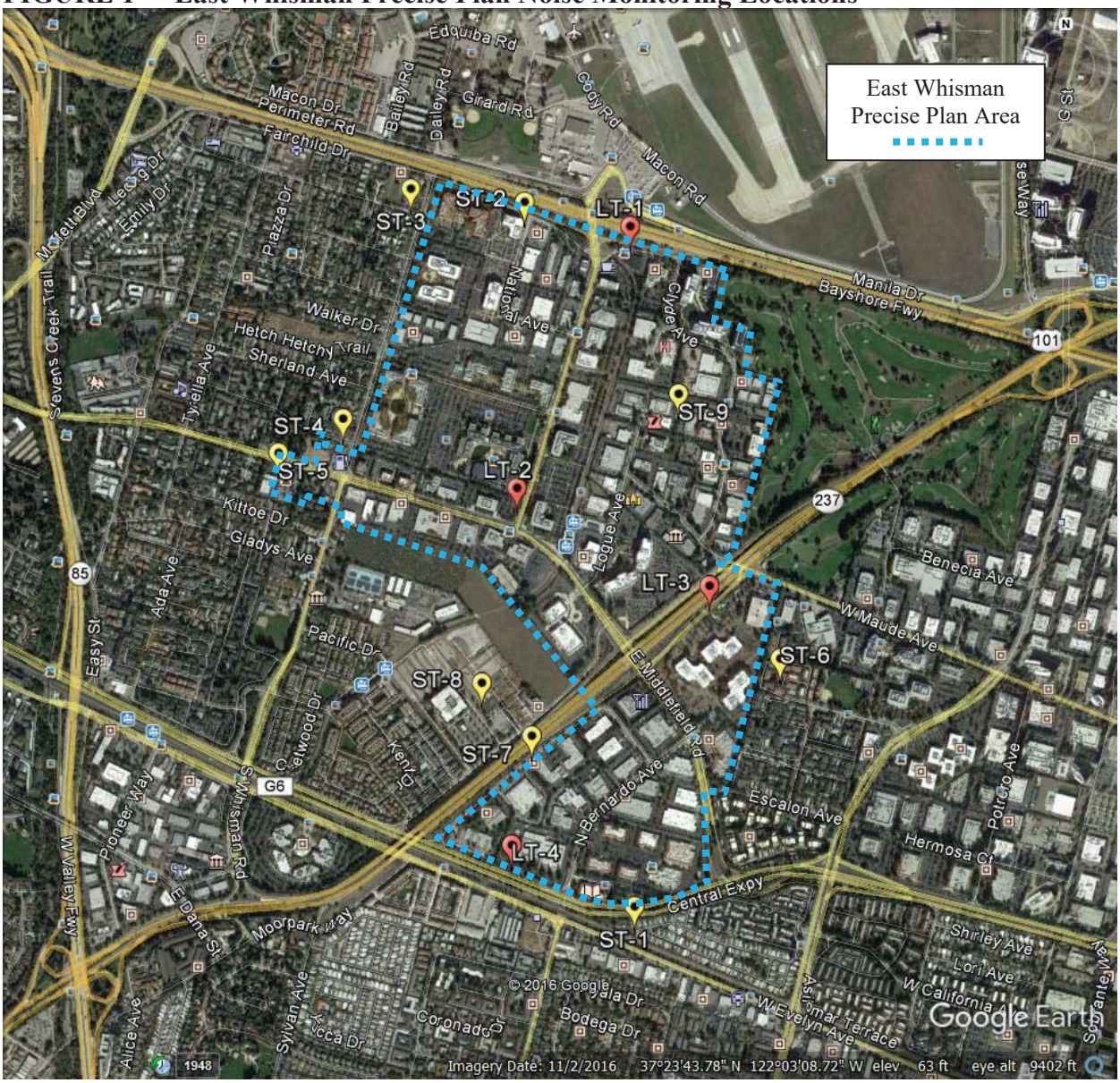


FIGURE 2 Long Term Noise Level Daily Trend for LT-1

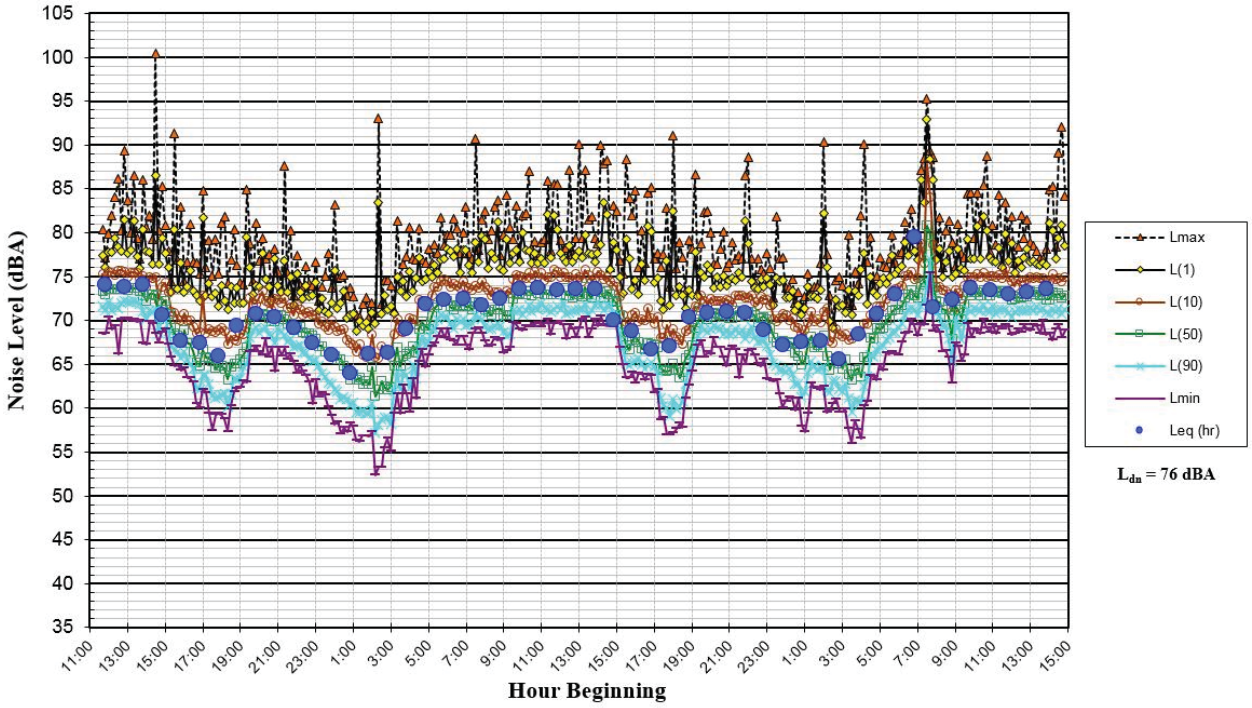


FIGURE 3 Long Term Noise Level Daily Trend for LT-2

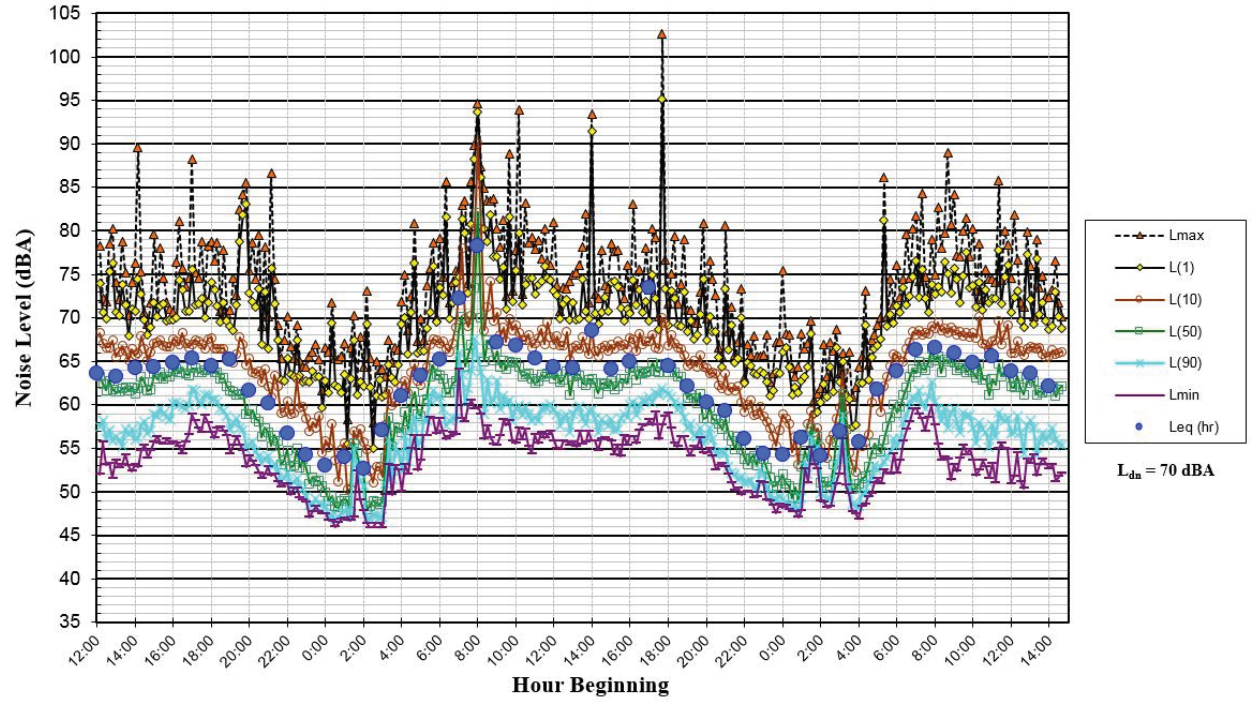


FIGURE 4 Long Term Noise Level Daily Trend for LT-3

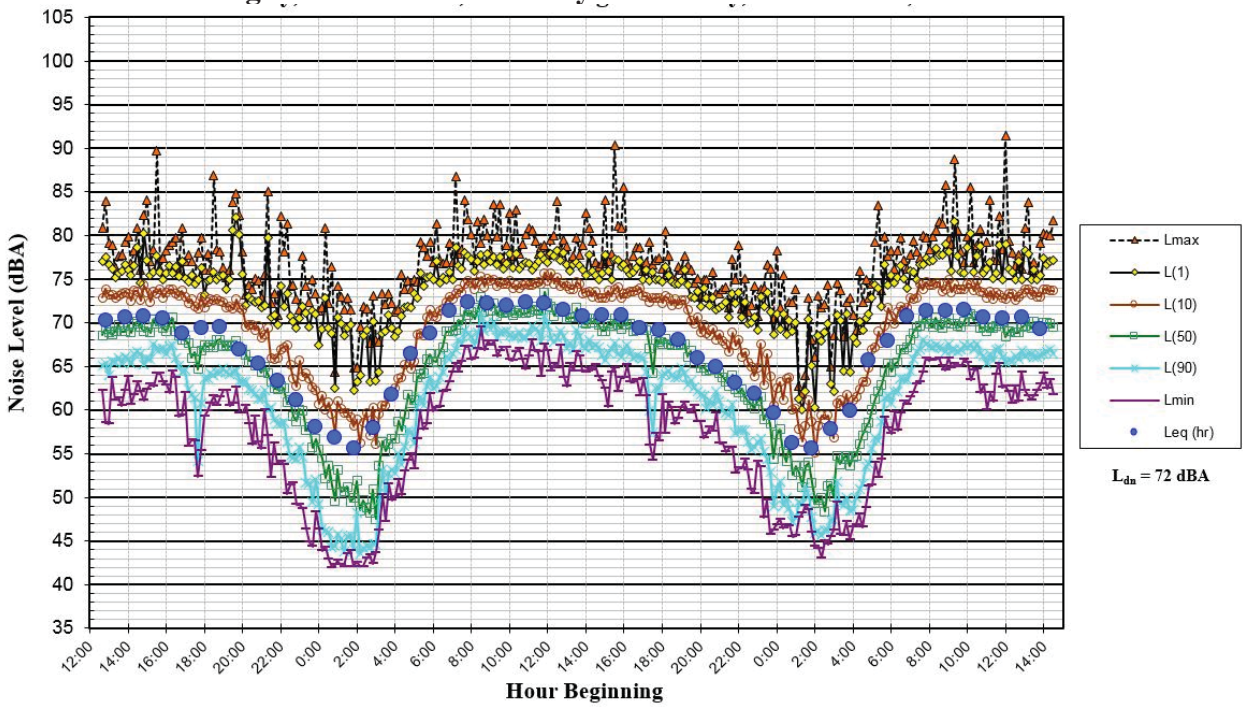


FIGURE 5 Long Term Noise Level Daily Trend for LT-4

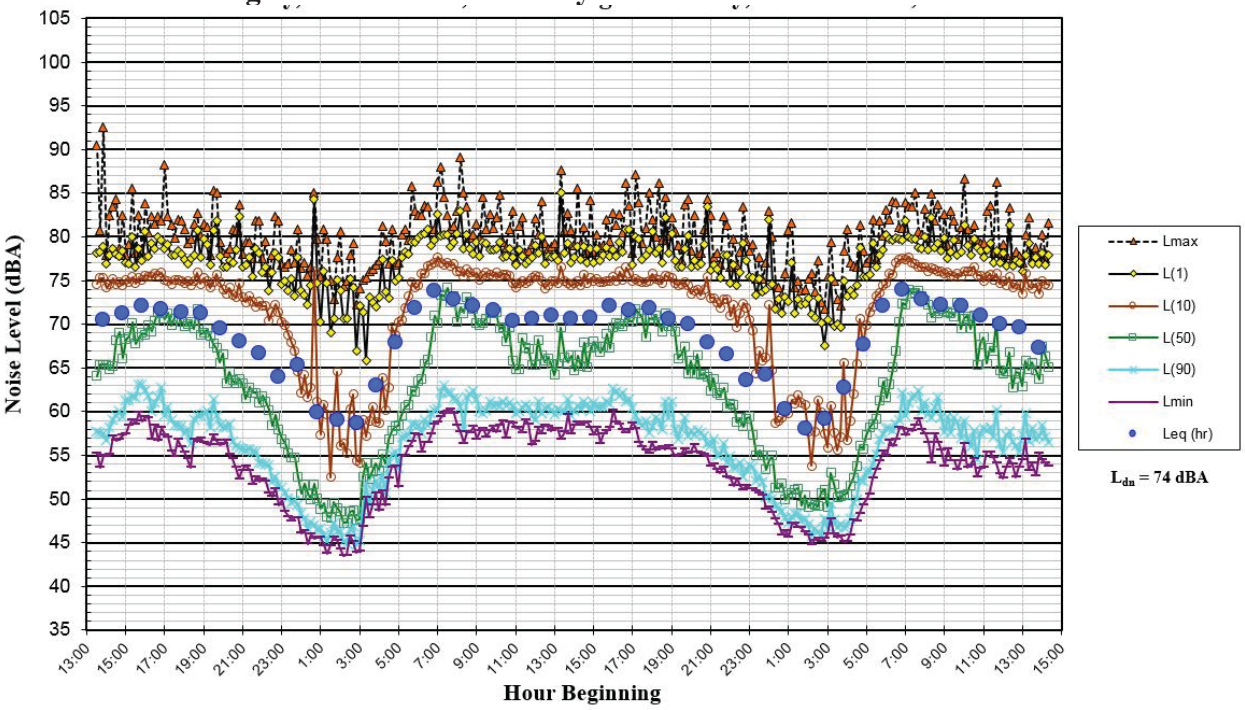


TABLE 6 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	Noise Source	L_{eq}	L_{max}	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{dn}
ST-1: ~15 feet from Buena Vista Ave centerline. (11/15/2016, 1:40-1:50 p.m.)	Central Expressway Traffic	56	66	58	55	52	59
ST-2: Corner of National Ave and Fairchild Dr. (11/15/2016, 2:20-2:30 p.m.)	U.S. 101 Traffic	70	76	71	70	67	73
ST-3: Corner of Evandale Ave and North Whisman Rd. (11/17/2016, 11:30-11:40 a.m.)	U.S. 101 Traffic	61	77	62	58	57	64
ST-4: Corner of Flynn Ave and North Whisman Rd. (11/17/2016, 11:50 a.m.-12:00 p.m.)	Local Traffic	56	69	61	53	49	60
ST-5: In front of 199 East Middlefield Rd. (11/17/2016, 12:20-12:30 p.m.)	Local Traffic	62	86	57	54	51	67
ST-6: In front of 437 Costa Mesa Terrace. (11/17/2016, 12:50-1:00 p.m.)	Local Traffic	45	55	46	44	43	46
ST-7: In front of 365 Ravendale Dr. (11/17/2016, 1:20-1:30 p.m.)	S.R. 237 Traffic	65	70	67	65	61	66
ST-8: Parking area east of 364 Ferguson Dr. (11/17/2016, 1:50-2:00 p.m.)	S.R. 237 Traffic	56	62	58	56	54	58
ST-9: Parking area west of 516 Clyde Avenue. (11/17/2016, 2:10-2:20 p.m.)	Local Traffic	50	60	51	49	47	52

Existing Vibration Environment

Groundborne vibration in the Plan Area results from Caltrain train and VTA light-rail train pass-bys. *I&R* has previously conducted train vibration studies for projects within or near the East Whisman Plan Area. The instrumentation used to make the vibration measurements included an audio recorder and seismic grade, low noise accelerometers firmly fixed to the ground. This system is capable of accurately measuring very low vibration levels. Vibration levels measured on the site are representative of vibration levels at ground level (i.e., vibration levels that would enter the building foundation).

The data from the previous studies showed that a one engine, five car Caltrain passenger train traveling at a speed of approximately 55 mph could produce vibration levels of 65 VdB at a setback

of 115 feet from the railroad tracks and 62 VdB at a setback of 145 feet from the railroad tracks.[2] The data for the VTA light-rail train indicated that a light-rail train traveling at a speed of approximately 25 mph could produce vibration levels ranging from 63 to 69 VdB at a setback of 35 feet from the VTA tracks and from 57 to 61 VdB at a setback of 55 feet from the VTA tracks.[3]

Future Noise Environment

SoundPLAN Version V8.0, a three-dimensional ray-tracing computer program, was used to calculate existing and future traffic noise level contours for the Plan Area and vicinity. The calculations took into account the sources of noise and the frequency spectra of the noise sources. Traffic data contained in the Draft Transportation Impact Analysis East Whisman Precise Plan[4] and posted travel speeds were also input into the model. For U.S. 101 and S.R. 237, traffic volumes and truck mix data input into the model were based on information published by the California Department of Transportation (Caltrans)[5]. To estimate 2018 and future 2030 volumes along U.S. 101 and S.R. 237, a conservative 2% increase was assumed and applied to the 2016 traffic volumes provided by Caltrans. Figure 6 summarizes existing traffic noise levels in the Plan Area, and Figure 7 summarizes 2030 plus project traffic noise levels in the Plan Area.

VTA light rail tracks run parallel to Ellis Street, approximately 465 feet to the east, with the Middlefield Station located just north of East Middlefield Road. Train pass-bys along these tracks would also impact the noise environment of noise-sensitive receptors adjacent to the tracks. From the noise report completed for the South Whisman Precise Plan EIR in December 2008,[3] noise levels approximately 65 feet from the center of the VTA line would be 62 dBA L_{dn}. Under future conditions, it is not anticipated that noise levels will measurably increase since light rail train volumes are not expected to increase in the future from the volumes in 2008.

Aircraft activities related to operations at Moffett Federal Airfield would also contribute to ambient noise levels within the Plan Area. Figure 8 shows the 2022 Moffett Federal Airfield aircraft noise contours in relation to the Plan Area. The northeastern corner of the Plan Area falls within the 70 dBA CNEL contour line for aircraft activities at Moffett Federal Airfield. The Plan Area is located more than three miles southeast of the Palo Alto Airport and well outside the airport's 65 dBA CNEL noise contour.

Wind tunnels located at the adjacent NASA Ames Research Center and Moffett Federal Airfield are additional sources of noise that may be audible at noise-sensitive land uses proposed within the Plan Area. Noise level contours contained in the NASA Ames Aerodynamics Testing Program Final EIS[6] show that, during operations, the 50 dBA noise contour for the wind tunnels would be approximately 800 feet or more to the west of the project site boundary; however, at times, operations from the wind tunnels may be audible within the Plan Area.

[2] Illingworth & Rodkin, Inc., "779 E. Evelyn Avenue Project Environmental Noise Assessment", November 2015.
[3] Illingworth & Rodkin, Inc., "South Whisman Precise Plan Environmental Noise Assessment", December 2008.
[4] East Whisman Precise Plan EIR, Draft Transportation Impact Analysis, Fehr & Peers, October 2018.
[5] 2016 Annual Average Daily Truck Traffic on the California State Highway System, California Department of Transportation.
[6] NASA Ames Aerodynamics Testing Program Final EIS, October 1998.

The Shoreline Amphitheatre is located just under two miles northwest of the project site. Concerts and festivals occurring at the Shoreline Amphitheatre are not expected to significantly impact receptors located within the Plan Area due to the distance from the project site. However, at times, noise generated at the amphitheater could be audible.

Commercial and industrial operations are the primary stationary noise sources that make a significant local contribution to community noise levels within the Plan Area. Such uses can generate noise due to the regular operation of equipment, including fans, blowers, chillers, compressors, boilers, pumps, and air conditioning systems that may run continuously. Other intermittent sources of noise include emergency generators, horns, buzzers, and loading activities.

Under the Precise Plan objectives, enhancing the Middlefield/Whisman Village Center is a key component. The Precise Plan contains minimum neighborhood commercial requirements for new development at this location and other key locations within the Plan Area. While specific types of commercial retail have not been identified, encouraging mixed-use development would potentially create noise and land use compatibility issues based on elevated noise from music, raised conversation, and other types of social environmental noise sources. *I&R* measured amplified music and speech at a restaurant in Santana Row in San José, which was located on the ground-level of a mixed-use building with apartments above the restaurant. The measurements were made on Friday and Saturday in the summer to characterize worst-case conditions. The amplified music and voices ranged from 74 to 75 dBA at a distance of approximately 25 feet from the open entryway. Other noise sources from the plaza included local traffic, conversations, children playing, outdoor dining, which produced noise levels ranging from 66 to 71 dBA when measured from a unit balcony located above the plaza. While noise and land use compatibility thresholds are typically not enforced on balconies and porches, sound-rated insulation features should be considered for residential units located within and surrounding the mixed-use areas in order to meet interior noise thresholds.

FIGURE 6 East Whisman Precise Plan Existing Traffic Noise Contours

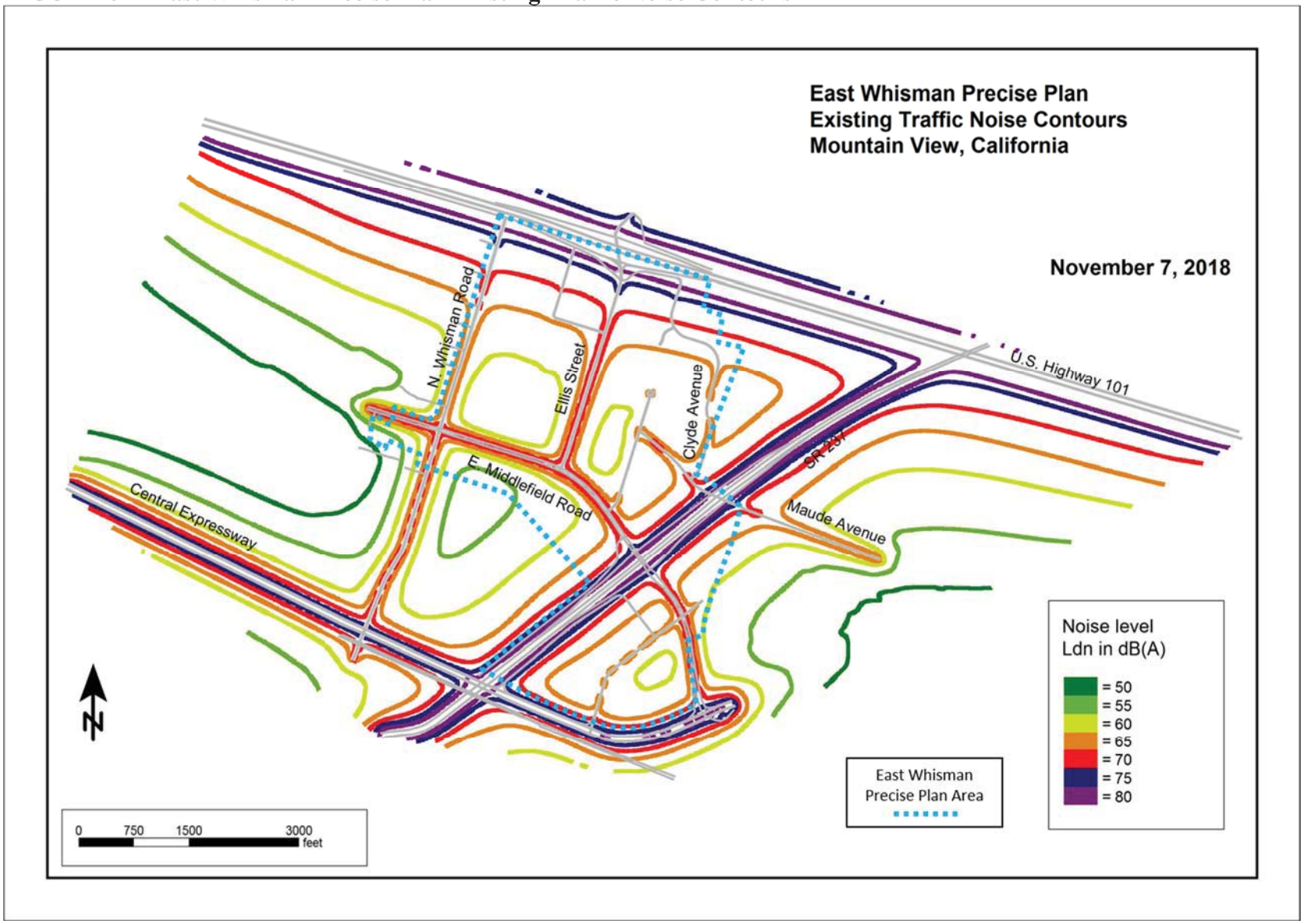


FIGURE 7 East Whisman Precise Plan Cumulative 2030 Plus Project Traffic Noise Contours

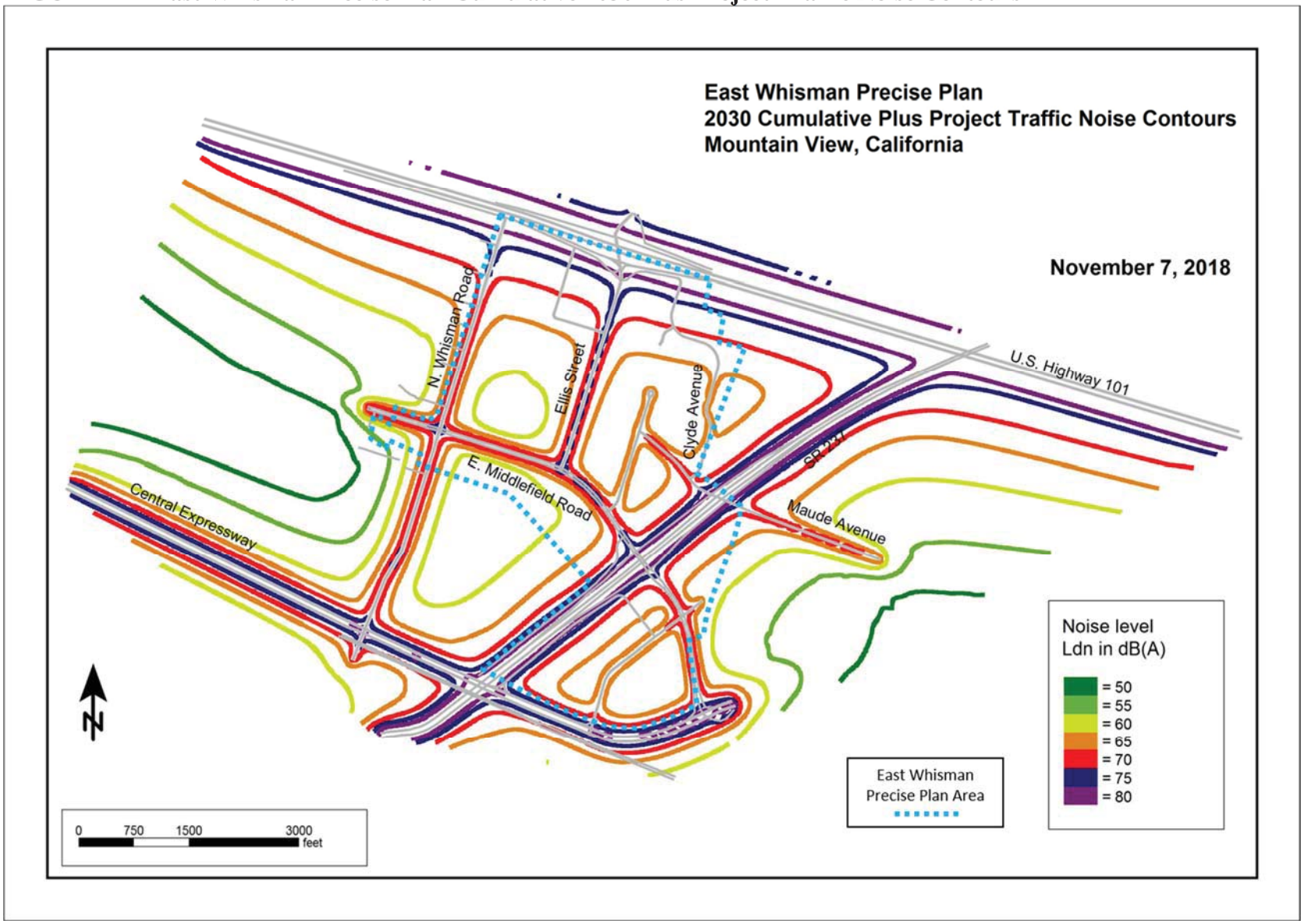


FIGURE 8 Moffett Federal Airfield 2022 Aircraft Noise Contours and the East Whisman Precise Plan Area

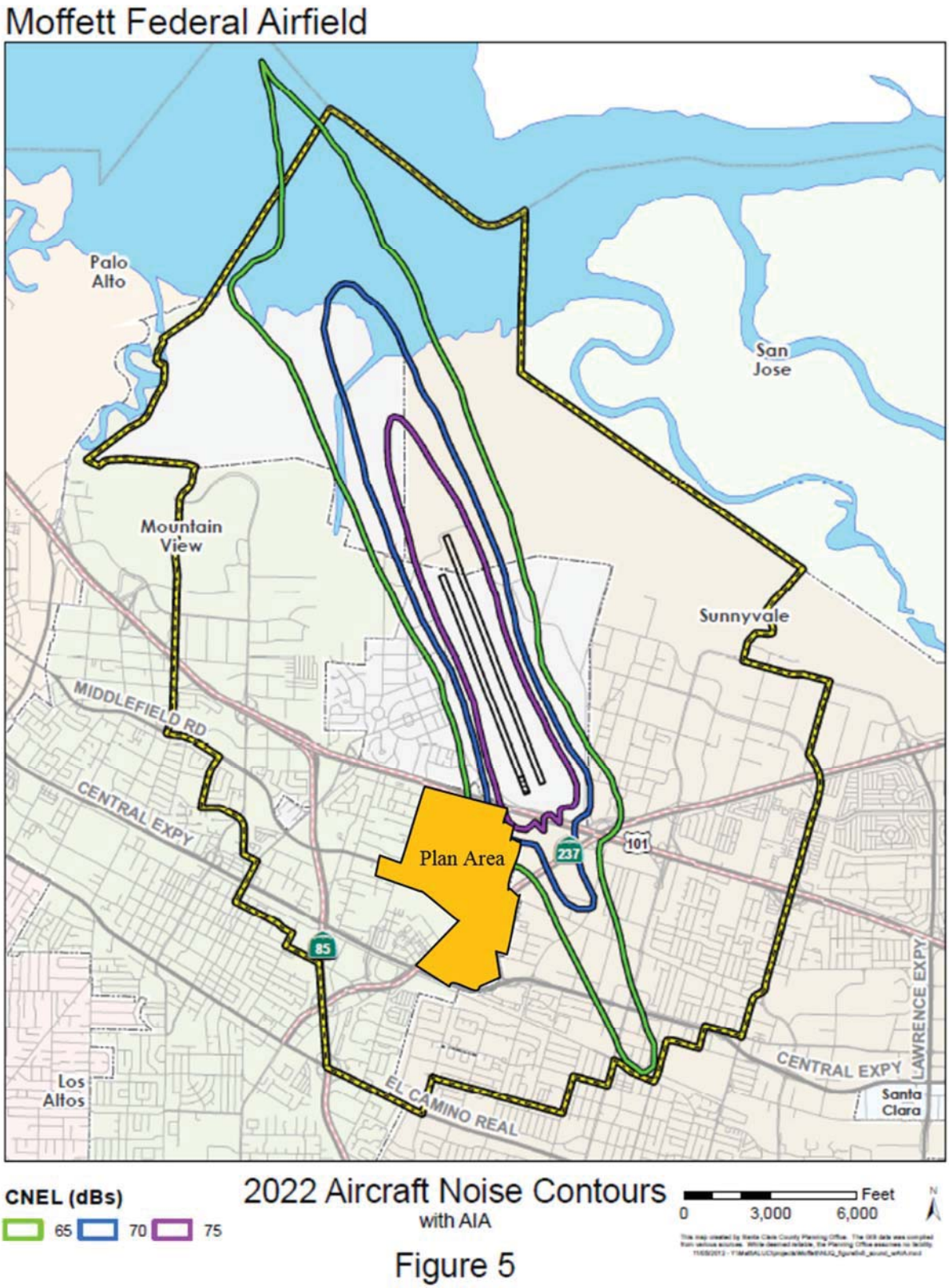


Figure 5

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

Future Exterior Noise Environment

Existing noise levels in the Plan Area were measured and calculated for this EIR using SoundPLAN Version V8.0. Additionally, future noise levels with the project were calculated with SoundPLAN. Existing and future noise levels at distances of 75 feet from the centerline of the primary roadways within the Plan Area are summarized in Table 7. Existing and future noise contours are graphically displayed on Figures 6 and 7.

As established by POLICY NOI 1.2 in the City's General Plan, exterior noise environments at private and community outdoor recreation use areas should be maintained at or below 65 dBA L_{dn} to be considered acceptable by the City of Mountain View. The noise standards do not apply to private decks and balconies in multi-family residential developments.

Noise produced by vehicular traffic along Plan Area roadways would expose residential land uses to levels above the 65 dBA L_{dn} exterior compatibility threshold. Future exterior noise levels at a distance of 75 feet from the centerline of the primary roadways traversing the area would typically range from 65 to 75 dBA L_{dn}. Future exterior noise levels along Fairchild adjoining U.S. 101 would range from 80 to 84 dBA L_{dn}.

With the implementation of the Precise Plan, there may be potential noise and land use conflicts between the proposed residential land uses and other land uses that are or would be significant sources of noise within or near the Plan Area. Noise produced by existing or proposed noise-generating land uses may be audible and disruptive to future residences within the Plan Area and would have the potential to violate the Section 21.26 of the City Code if the noises generated by such uses are not regulated or adequately mitigated.

Moffett Federal Airfield, a joint civil-military airport, is located across U.S. 101 to the north of the Plan Area. The ALUC Airport Land Use Plan establishes 65 dBA CNEL as the maximum allowable noise level considered compatible with residential uses. Figure 9 shows the approximate location the of 65 dBA CNEL noise contour on the Neighborhoods Overlay map. A portion of the Maude Neighborhood residential area would be located inside the 65 dBA CNEL noise impact boundary.

Future Interior Noise Environment

POLICY NOI 1.2 of the City's General Plan requires that interior noise levels within residences be maintained at or below 45 dBA L_{dn}. Maximum instantaneous noise levels inside residences that result from aircraft or rail operations shall not exceed 65 dBA L_{max}. Standard residential construction with the windows partially open for ventilation provides approximately 15 dBA of exterior to interior noise reduction. Standard residential construction assuming the incorporation of adequate forced-air mechanical ventilation (allowing the occupant to control noise by maintaining the windows shut) provides 20 to 25 dBA of outdoor to indoor noise reduction in

interior spaces. Where exterior noise levels exceed 60 dBA L_{dn}, or 80 dBA L_{max} from aircraft or trains, forced-air mechanical ventilation systems are normally required. Where exterior noise levels exceed 70 dBA L_{dn}, or 90 dBA L_{max} from aircraft or trains, special sound rated construction systems are normally required. The exact specifications of window and wall systems cannot be accurately predicted at this time, but once building elevations and floor plans are developed, the specifications can be made. To control interior maximum noise levels to minimize the potential for activity interference and sleep disturbance, noise insulation features such as stucco-sided walls and sound-rated windows and doors may be used. The noise control treatments should be designed to reduce interior noise levels to 45 dBA L_{dn} or less.

The ALUC Land Use Plan for Moffett Federal Airfield categorizes as "unacceptable" residential development within the 65 dBA CNEL noise contour and "new construction or development should not be undertaken." The area within the proposed Maude Neighborhood generally north of the 65 dBA CNEL shown on Figure 9 would fall within this category. A portion of the area designated for Office/R&D High generally north of the 70 dBA CNEL contour would fall within the "conditionally unacceptable" category where new development is discouraged and should only proceed after a detailed analysis of noise control requirements is completed and appropriate measures are included in the design.

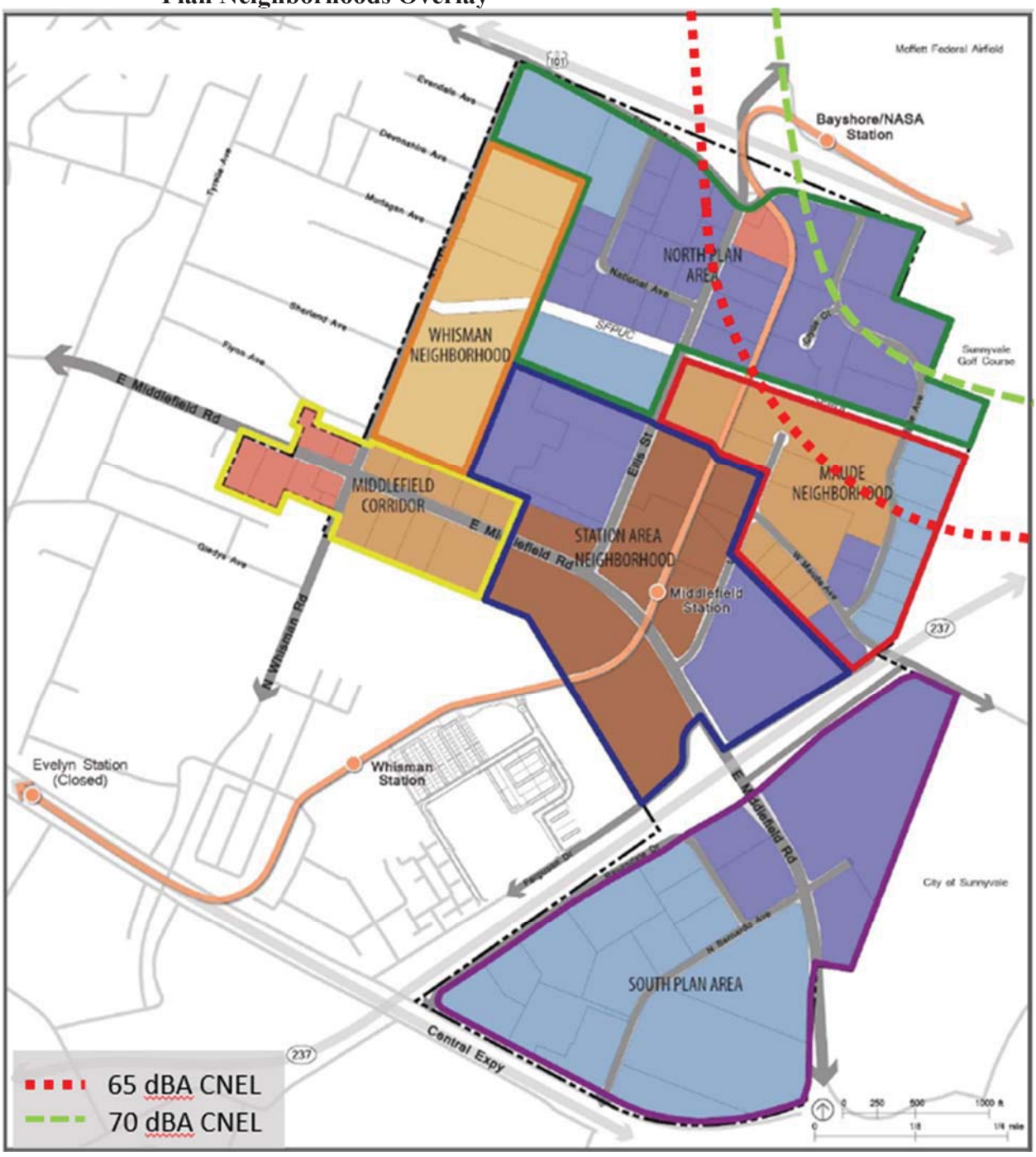
TABLE 7 Modeled Noise Levels for Existing and 2030 Plus Project Conditions

Location	L_{dn} at 75 feet, dBA L_{dn}			Noise Level Increase over Existing, dBA		Increase of 2030 Plus Project Over 2030 No Project, dBA
	Existing	2030 No Project	2030 Plus Project	2030 No Project	2030 Plus Project	
Ellis St, north of U.S. 101 NB	75	76	76	1	1	0
Ellis St, Fairchild to National	72	73	73	1	1	0
Ellis St, Middlefield to National	68	70	70	2	2	0
Whisman Rd, south of Whisman Station	67	68	69	1	2	1
Whisman Rd, Whisman to Middlefield	66	67	68	1	2	1
Whisman Rd, Middlefield to Fairchild	72	73	73	1	1	0
Clyde Ave	66	67	67	1	1	0
Logue Ave	63	64	64	1	1	0
Bernardo Ave	64	65	65	1	1	0
Ferguson Dr, south of Middlefield	68	69	69	1	1	0
Fairchild, west of Whisman (U.S. 101)	83	84	84	1	1	0
Fairchild, Whisman to National (U.S. 101)	82	83	83	1	1	0
Fairchild, National to Ellis (U.S. 101)	79	80	80	1	1	0
Fairchild, east of Ellis (U.S. 101)	78	79	79	1	1	0
National Ave	68	69	69	1	1	0
Maude Ave, west of Clyde Ave	65	66	66	1	1	0
Maude Ave, Clyde to S.R. 237	70	71	71	1	1	0
Maude Ave, west of S.R. 237	65	66	66	1	1	0
Middlefield, west of Whisman	64	66	66	2	2	0
Middlefield, Whisman to Ellis	65	66	66	1	1	0
Middlefield, Ellis to Logue	66	67	67	1	1	0
Middlefield, Logue to Ferguson	68	68	68	<1	<1	0
Middlefield, Ferguson to S.R. 237	71	72	72	1	1	0
Middlefield, S.R. 237 WB to EB	81	82	82	1	1	0
Middlefield, S.R. 237 to Bernardo	69	70	70	1	1	0
Middlefield, east of Bernardo	65	66	66	1	1	0

Location	L_{dn} at 75 feet, dBA L_{dn}			Noise Level Increase over Existing, dBA		Increase of 2030 Plus Project Over 2030 No Project, dBA
	Existing	2030 No Project	2030 Plus Project	2030 No Project	2030 Plus Project	
Central Expwy, west of Whisman	72	73	73	1	1	0
Central Expwy, Whisman to Ferguson	72	73	73	1	1	0
Central Expwy, Ferguson to Bernard	72	73	73	1	1	0
Central Expwy, east of Bernardo	73	74	74	1	1	0
U.S. 101	86	87	87	1	1	0
S.R. 237	80	81	81	1	1	0
Bernardo, south of Middlefield	64	65	65	1	1	0

Source: Illingworth & Rodkin, Inc., November 2018 and modified May 2019.

FIGURE 9 Moffett Federal Airfield Noise Contour Lines with the East Whisman Precise Plan Neighborhoods Overlay



Recommendations to Reduce Future Residential Exterior and Interior Noise Levels

As mandated by General Plan POLICY NOI 1.3, an acoustical study shall be conducted when an application is received for a residential development. The study shall identify the existing noise sources affecting the parcel, the site's noise exposure, and site-specific measures to reduce exterior and interior noise levels.

The following general recommendations shall be considered to reduce exterior noise levels in private and community outdoor recreation use areas to 65 dBA L_{dn} or less to meet the requirements of General Plan POLICY NOI 1.2:

- When developing a parcel's site plan, locate noise-sensitive outdoor use areas away from major roadways and significant office or commercial noise sources. Shield noise-sensitive spaces with buildings or noise barriers to reduce exterior noise levels. The final detailed design of the heights and limits of proposed noise barriers shall be completed at the time that the final site and grading plans are submitted.

- The City should consider policies to address potential noise conflicts between noise-sensitive and noise-producing land uses. Policies may include notifying neighbors of potential noise disturbance or temporary exceptions for existing noise-producing land uses to meet the thresholds, and approval of residential site designs to be acoustically compatible with noise-producing land uses.

The following general recommendations shall be considered to reduce interior noise levels to 45 dBA L_{dn} or less to meet the requirements of General Plan POLICY NOI 1.2:

- Project-specific acoustical analyses are mandated by the State where noise levels exceed 60 dBA L_{dn}. The analyses shall meet the following noise reduction requirements. Interior average noise levels shall be reduced to 45 dBA L_{dn} or lower to meet State and local standards. New construction shall also achieve an interior noise level of 65 dBA (L_{max}) through measures such as site design or special construction materials. The analysis should also consider measures to further reduce noise to minimize activity interference and sleep disturbance. Building sound insulation requirements would need to include the provision of forced-air mechanical ventilation for all new units exposed to exterior noise levels greater than 60 dBA L_{dn}, so that windows could be kept closed at the occupant's discretion to control noise. Special building construction techniques (e.g., sound-rated windows and building facade treatments) would be required for new residential uses adjacent to arterial roadways, the Maude Neighborhood due to aircraft noise, and noise-producing commercial and industrial land uses. These treatments include, but are not limited to, sound rated windows and doors, sound rated wall constructions, acoustical caulking, etc. The specific determination of what treatments are necessary will be conducted on a unit-by-unit basis. Results of the analysis, including the description of the necessary noise control treatments, will be submitted to the City along with the building plans and approved prior to issuance of a building permit. Feasible construction techniques such as these would adequately reduce interior noise levels to 45 dBA L_{dn} or lower.

Pursuant to the guidance in the Santa Clara County Comprehensive Land Use Plan for Moffett Federal Airfield, the City should consider no new residential development within the adopted 65 dBA CNEL contour for Moffett Federal Airfield. This would include a portion of the proposed Maude Neighborhood shown on Figure 9. If residential development in this area is approved, then the following ALUC policy should be applied:

- 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.

Furthermore, the City should consider requiring Avigation Easements as defined in the ALUC Plan.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

Paraphrasing from Appendix G of the CEQA Guidelines, a project would normally result in significant noise impacts if noise levels generated by the project conflict with adopted environmental standards or plans, if the project would generate excessive ground-borne vibration levels, or if ambient noise levels at sensitive receivers would be substantially increased over a permanent, temporary, or periodic basis. The following criteria were used to evaluate the significance of environmental noise resulting from the project:

- **Noise Levels in Excess of Standards:** A significant noise impact would be identified if projects facilitated by the Precise Plan would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan or Municipal Code.

- **Ground-borne Vibration from Construction:** A significant impact would be identified if the construction of projects facilitated by the Precise Plan would expose persons to excessive vibration levels. Ground-borne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in cosmetic damage to normal buildings.

- **Project-Generated Traffic Noise Increases:** A significant impact would be identified if traffic generated by development facilitated by the Precise Plan would substantially increase noise levels at sensitive receivers within the Plan Area or in the vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA L_{dn} or greater, with a future noise level of less than 60 dBA L_{dn}, or b) the noise level increase is 3 dBA L_{dn} or greater, with a future noise level of 60 dBA L_{dn} or greater.

- **Construction Noise:** A significant noise impact would be identified if construction-related noise would temporarily increase ambient noise levels at sensitive receptors. Hourly average noise levels exceeding 60 dBA L_{eq} at the property lines shared with residential

land uses, and the ambient by at least 5 dBA L_{eq}, for a period of more than one year would constitute a significant temporary noise increase at adjacent residential land uses. For commercial uses, a significant impact would be identified if construction noise were to exceed 70 dBA L_{eq} and exceeds the ambient noise environment by at least 5 dBA L_{eq} for a period exceeding one year.

Impact 1: **Noise Levels in Excess of Standards.** Construction activities facilitated by the implementation of the Precise Plan would be expected to be conducted in accordance with allowable hours of construction as specified in the City Code. Similarly, noise levels produced by the operation of stationary equipment would be required to adhere to the allowable noise limits specified in the City Code. **This is a less-than-significant impact.**

Construction Noise

This analysis assumes that construction activities for proposed projects facilitated by the Precise Plan would adhere to the allowable hours of construction as specified in the City Code (7:00 a.m. and 6:00 p.m. Monday through Friday). Construction activities would not occur on weekends or holidays, as specified in the Municipal Code, unless prior written approval is granted by the building official.

Operational Noise

The Precise Plan would facilitate the development of noise-generating land uses that would have the potential to generate noise levels in excess of allowable noise limits. General Plan POLICY NOI 1.7 restricts noise levels from stationary sources through enforcement of the Noise Ordinance. The City Code states that stationary equipment noise from any property must be maintained at or below 55 dBA L_{eq} during daytime hours (i.e., between 7:00 a.m. and 10:00 p.m.) and at or below 50 dBA L_{eq} during nighttime hours (i.e., between 10:00 p.m. and 7:00 a.m.) as measured at residential land uses.

Various mechanical equipment for heating, ventilation, and cooling purposes, exhaust fans, emergency generators, and other similar equipment could produce noise levels exceeding the daytime and nighttime noise limits when located near existing or proposed residential land uses with the Plan Area. Due to the number of variables inherent in the mechanical equipment needs of an individual project (number and types of units, locations, size, housing, specs, etc.), the impacts of mechanical equipment noise on nearby noise-sensitive uses should be assessed during the final design stage of individual projects. As required by the City Code and the City's standard conditions of approval, design planning should take into account the noise criteria associated with such equipment and utilize site planning to locate equipment in less noise-sensitive areas. Other controls could include, but shall not be limited to, fan silencers, enclosures, and screen walls. With the implementation the City of Mountain View's limits for stationary noise sources and City of Mountain View's standard conditions of approval, the impact upon existing receptors within the Plan Area and in the vicinity of the Plan Area would be reduced to a less-than-significant level.

Mitigation Measures: **None required.**

Impact 2: **Exposure to Excessive Ground-borne Vibration due to Construction.** Residences, businesses, and historic structures could be exposed to construction related vibration during the excavation and foundation phases of development project facilitated by the Precise Plan. **This is a significant impact.**

Construction of projects within the East Whisman Precise Plan area may, in some cases, be located directly adjacent to or near existing structures. Construction activities may include demolition of existing structures, site preparation work, excavation of below grade levels, foundation work, pile driving, and new building erection. Demolition for an individual site may last several weeks and at times may produce substantial vibration. Excavation for underground levels would also occur on some project sites and vibratory pile driving could be used to stabilize the walls of the excavated area. Piles or drilled caissons may also be used to support building foundations.

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened.

Table 8 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.), may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Pile driving has the potential of generating the highest ground vibration levels and is of primary concern to architectural damage, particularly when it occurs within 100 to 200 feet of structures. Vibration levels generated by pile driving activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used but could exceed the recommended PPV thresholds to avoid architectural damage. Other project construction activities, such as caisson drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may also potentially generate substantial vibration in the immediate vicinity.

Depending on the proximity of existing structures to each construction site, the structural soundness of the existing buildings, and the methods of construction used, vibration levels may be high enough to damage existing structures. Given the scope of the Precise Plan and the proximity of many existing structures, ground-borne vibration impacts would be potentially significant.

TABLE 8 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Approximate L_v at 25 ft. (VdB)
Pile Driver (Impact)	upper range	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

As with any type of construction, vibration levels may at times be perceptible. However, construction phases that have the highest potential of producing vibration (pile driving and use of jackhammers and other high-power tools) would be intermittent and would only occur for short periods of time for any individual project site. 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 to hours with least potential to affect nearby businesses, perceptible vibration can be kept to a minimum and as such would not result in a significant impact with respect to perception.

Mitigation Measures: The following measures are recommended to reduce vibration from construction activities:

- Avoid impact pile driving where possible. Drilled piles cause lower vibration levels where geological conditions permit their use.

- Avoid using vibratory rollers and tampers near sensitive areas.

- In areas where project construction is anticipated to include vibration-generating activities, such as pile driving, in close proximity to existing structures, site-specific vibration studies should be conducted to determine the area of impact and to present appropriate mitigation measures that may include the following:

    - Identification of sites that would include vibration compaction activities such as pile driving and have the potential to generate ground-borne vibration, and the sensitivity of nearby structures to ground-borne vibration. Vibration limits should be applied to

all vibration-sensitive structures located within 200 feet of the project. A qualified structural engineer should conduct this task.

- 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 construction conditions.

- Construction contingencies would be identified for when vibration levels approached the limits.

- At a minimum, vibration monitoring should be conducted during initial demolition activities and during pile driving activities. Monitoring results may indicate the need for more or less intensive measurements.

- When vibration levels approach limits, suspend construction and implement contingencies 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.

Impact 3: **Permanent Cumulative Noise Level Increase.** The proposed project would not result in a substantial permanent noise level increase at the existing noise-sensitive residential land uses within the Plan Area or at existing noise-sensitive residential land uses within the project vicinity. **This is a less-than-significant impact.**

Increases in traffic noise gradually degrade the environment in areas sensitive to noise as development occurs and the population increases. Proposed roadway modifications could also increase or decrease traffic noise levels depending on the circumstances of each individual project.

For a substantial permanent cumulative noise impact to occur, two qualifications must be met: 1) the 2030 cumulative plus project traffic volumes increase noise levels at sensitive receptors by 5 dBA L_{dn} or greater above existing conditions, with a future noise level of less than 60 dBA L_{dn}, or 3 dBA L_{dn} or greater above existing conditions, with a future noise level of 60 dBA L_{dn} or greater; and 2) the 2030 cumulative plus project traffic noise levels increase by 1 dBA L_{dn} or more as compared to 2030 cumulative (no project) conditions, which would be considered a cumulatively considerable contribution to the overall traffic noise increase.

SoundPLAN Version V8.0 was used to calculate the traffic noise increase expected by 2030 using the traffic data supplied by *Fehr and Peers*. Traffic noise levels shown in Table 7 were projected for cumulative conditions, with and without the Precise Plan, for the year 2030. Traffic noise levels would be increased by 1 to 2 dBA L_{dn} above existing traffic noise levels at noise-sensitive receptors within the Plan Area and outside the Plan Area. The first qualification is not met under any case and the traffic noise level increases expected under cumulative (no project) and cumulative plus project conditions would not be substantial, resulting in a less-than-significant cumulative impact.

Mitigation Measures: **None required.**

Impact 4: **Temporary Construction Noise.** Construction activities would temporarily increase ambient noise levels at noise-sensitive receptors within and adjacent to Plan Area. The impact would be considered **less-than-significant** recognizing the duration of exterior construction activities, the construction contractor will implement construction noise control best management practices at the site, and construction activities will be conducted during hours allowed in the City of Mountain View City Code.

Construction activities would occur intermittently at different sites within in the Plan Area until full build-out. Although the related noise impacts at any one location would be temporary, construction of individual projects could cause adverse localized effects on the ambient noise environment. Where noise from construction activities exceeds 60 dBA L_{eq} and exceeds the ambient noise environment by at least 5 dBA L_{eq} at noise-sensitive residential uses in the project vicinity for a period exceeding one year, the impact would be considered significant. For commercial uses, a significant impact would be identified if construction noise were to exceed 70 dBA L_{eq} and exceeds the ambient noise environment by at least 5 dBA L_{eq} for a period exceeding one year.

Noise impacts resulting from construction depend on 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 typically 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 if 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. Typical hourly average construction generated noise levels are about 81 dBA to 88 dBA measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). Hourly average noise levels generated by the construction of residential units would range from about 65 dBA to 88 dBA measured at a distance of 50 feet depending on the amount of activity at the site. Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often result in lower construction noise levels at distant receptors. Lower noise levels result from building construction activities when these activities move indoors and less heavy equipment is required to complete the tasks. Typical construction noise levels at a distance of 50 feet are shown in Tables 9 and 10. Table 9 shows the average noise level ranges, by construction phase, and Table 10 shows the maximum noise level ranges for different construction equipment.

TABLE 9 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

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

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

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

TABLE 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.

Temporary construction noises are disturbances that are necessary for the construction or repair of buildings and structures in urban areas. Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction materials, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as constructing temporary noise barriers and utilizing "quiet" construction equipment can also reduce the potential for noise impacts.

Noise generated by construction activities would temporarily elevate noise levels at adjacent noise sensitive receptors, but this would be considered a less-than-significant impact assuming that construction activities are conducted in accordance with the provisions of the City of Mountain View City Code and with the implementation of construction best management practices. A Construction Noise Logistics Plan shall be developed and specify the hours of construction, noise and vibration minimization measures, posting or notification of the method of construction and schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints. Additionally, the Construction Noise Logistics Plan shall include measures 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. A typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Pursuant to Section 8.70.1 of the City Code, restrict noise-generating activities at construction sites or in areas adjacent to construction sites to the hours between 7:00 a.m. and 6:00 p.m., Monday through Friday. Construction shall be prohibited on Saturdays, Sundays and holidays unless prior written approval is granted by the building official.

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

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

- Locate all stationary noise generating equipment, such as air compressors or portable power generators, construction staging areas, and construction material areas as far as possible from sensitive receptors. 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.

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

- Route all construction traffic via designated truck routes where possible. Prohibit construction related heavy truck traffic in residential areas where feasible.

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

- 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.

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

The implementation of the reasonable and feasible controls outlined above would reduce construction noise levels emanating from the site in order to minimize disruption and annoyance. With the implementation of these controls, as well as the City of Mountain View's limits on allowable construction hours and City of Mountain View's standard conditions of approval, the impact would be reduced to a less-than-significant level.

Mitigation Measures: **No additional measures are required.**