3.9 - Noise and Vibration

3.9.1 - Introduction

This section describes the existing noise setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on a noise study prepared by Veneklasen Associates and additional analysis provided by Michael Brandman Associates included in this EIR as Appendix F.

3.9.2 - Environmental Setting

Acoustical Terminology

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The unit of sound pressure, a ratio of the faintest sound detectable by a keen human ear, is called a decibel (dB).

A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. The zero point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or fewer are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness.

Because sound or noise can vary in intensity by over 1 million times within the range of human hearing, a logarithmic loudness scale similar to the Richter scale used for earthquake magnitude is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called A weighting, written as dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Any further reference to decibels in this report written as dB should be understood to be A-weighted values.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time-varying period (called L_{eq}), or, alternately, as a statistical description of the sound pressure level that is exceeded over some fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at

night, State law requires that, for planning purposes, an artificial dB increment be added to quiet-time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL).

Many methods have been developed for evaluating community noise to account for, among other things:

- Variation in noise levels over time
- Influence of periodic individual loud events
- Community response to changes in the community noise environment

Several methods have been developed to measure sound over a period of time, including:

- Equivalent Sound Level (L_{eq})
- Community Noise Equivalent Level (CNEL)
- Day/Night Average Sound Level (L_{dn} or DNL)

These methods are described and defined below.

L_{eq}

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time-varying period (called L_{eq}), or, alternately, as a statistical description of the sound pressure level that is exceeded over some fraction of a given observation period. For example, the noise levels exceeded on 10 percent of readings is called L_{10}, the median (50th percentile) reading is called L_{50}, etc.

CNEL

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment penalty be added to quiet time noise levels in a 24-hour noise descriptor called CNEL.

L_{dn} or DNL

Another commonly used method is the day/night average level (L_{dn} or DNL). The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period, called the L_{eq}. The L_{dn} is calculated by averaging the L_{eqs} for each hour of the day at a given location after penalizing the sleeping hours (defined as 10:00 p.m. to 7:00 a.m.) by 10 dBA to account for the increased sensitivity of people to noises that occur at night. The maximum noise level recorded during a noise event is typically expressed as L_{max}. The sound level exceeded over a specified time can be expressed as L_n (e.g., L_{90}, L_{50}, L_{10}, etc.). L_{50} equals the level exceeded 50 percent of the time, L_{10} equals the level exceeded 10 percent of the time, etc.

As previously mentioned, people respond to changes in sound pressure, which are measured on a noise scale in a logarithmic manner. In general, a 3-dB change in sound pressure level is considered a just detectable difference in most situations. A 5-dB change is readily noticeable, and a 10-dB change is considered a doubling (or halving) of the subjective loudness. Note that a 3-dB increase or decrease in the average traffic nose level is realized by a doubling or halving of the traffic volume, or by about a 7-mile-per-hour increase or decrease in speed.

For each doubling of distance from a point noise source, the sound level will decrease by 6 dB. In other words, if a person is 100 feet from a machine and moves 200 feet from that source, sound levels will drop by approximately 6 dB. Moving 400 feet away, sound levels will drop approximately another 6 dB. For each doubling of distance from a line source, such as a roadway, noise levels are reduced 3 to 5 decibels, depending on the ground cover between the source and the receiver.

Noise Exposure

As shown in Table 3.9-1, a noise level of 65 dB is the level at which ambient noise begins to interfere with one's ability to carry on a normal conversation at reasonable separation without raising one's voice. The noise attenuation that occurs within residential structures with closed windows is about 20 dB. Due to this 20 dB noise attenuation between outdoor levels and indoor levels, a 45dB interior noise standard can be achieved with an exterior noise exposure of 65 dB CNEL without any specialized structural attenuation (e.g., dual-paned windows). Local and state regulations recognize this 20dB attenuation. For example, the City of Milpitas has set a 45dB standard for interior noise and a 65 dB standard for exterior noise. (See also California Code of Regulations Title 24 Part 2, Vol. 1 Section 1207, which require noise insulation adequate to achieve an interior noise level of 45 dB CNEL in hotels, motels, dormitories, apartment homes, and dwellings (other than detached single-family dwellings).

Table 3.9-1: Noise Levels and Human Response

Noise Source	Noise Level (dBA)	Response
Library	30	Very quiet
Refrigerator humming	40	Quiet
Quiet office	50	Quiet
Normal conversation	60	Intrusive
Vacuum cleaner	70	Telephone use difficult
Freight train at 50 feet	80	Interferes with conversation
Heavy-duty truck at 50 feet	90	Annoying
Jet takeoff at 2,000 feet	100	Very annoying; hearing damage at sustained exposure levels
Unmuffled motorcycle	110	Maximum vocal effect; physical discomfort

Table 3.9-1 (cont.): Noise Levels and Human Response

Noise Source	Noise Level (dBA)	Response
Jet takeoff at 200 feet	120	Regular exposure over one minute risks permanent hearing loss
Shotgun firing	130	Pain threshold
Carrier jet operation	140	Harmfully loud
Source: Melville C. Branch and R. Dale Beland, 1970.		

Groundborne Vibration

Groundborne vibration consists of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibration typically cause a nuisance only to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors, where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and typically only exists indoors. It is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) relates to the maximum instantaneous peak of the vibration signal and is often used in measuring the magnitude of vibration. Scientific studies have shown that human responses to vibration vary by the source of vibration: continuous or transient. Continuous sources of vibration include construction, while transient sources include truck movements. Generally, the thresholds of perception and annoyance are higher for transient sources than continuous sources. Table 3.9-2 shows PPV levels for continuous and transient sources and the associated human response.

Table 3.9-2: Response to Groundborne Vibration

Peak Particle Velocity (inches/second)		Human Response
Continuous	Transient	
0.40	2.00	Severe
0.10	0.90	Strongly perceptible
0.04	0.25	Distinctly perceptible
0.01	0.04	Barely perceptible
Source: California Department of Transportation, 2004.		

Existing Noise Levels

Noise from vehicular movement on E. Calaveras Boulevard and train activity associated with the Union Pacific Railroad are the dominant noise sources impacting the site. Veneklasen Associates visited the site to perform noise measurements of the existing conditions.

Veneklasen Associates positioned a long-term noise monitor on the northwest corner of the roof of the existing Sun Microsystems building that operated and stored data from Tuesday January 17, 2012 to Tuesday January 24, 2012. Table 3.9-3 reports the average L_{eq} and L_{dn} measured during the dates monitored. The L_{dn} value was computed from the hourly average noise levels. Exhibit 3.9-1 shows the location of the long-term measurement location represented as L1 on the site.

Table 3.9-3: Existing (Ambient) Long-Term Noise Level Measurement

Measurement Date	Daytime Average (dBA L_{eq})	Nighttime Average (dBA L_{eq})	Noise Level, (dBA L_{dn})
Tuesday (1-17-12)*	59	55	58
Wednesday (1-18-12)	58	56	63
Thursday (1-19-12)	56	58	63
Friday (1-20-12)	59	55	62
Saturday (1-21-12)	60	55	63
Sunday (1-22-12)	57	52	59
Monday (1-23-12)	61	56	63
		Total Combined	**63**

Notes:
Noise measurements taken from Tuesday, January 17, 2012 to Tuesday January 24, 2012.
* Noise measurement did not include all 24-hours of day.
Source: Veneklasen Associates, 2012.

Table 3.9-3 above shows that at the location of the long-term noise measurement, the noise level is currently exceeds the City's 60 dBA L_{dn} single-family residential exterior noise standard.

Veneklasen Associates also completed short-term noise measurements at four locations on the project site. A summary of the short-term noise measurement results are shown below in Table 3.9-4 and the noise measurement locations are shown in Exhibit 3.9-1.

Table 3.9-4: Existing (Ambient) Short-Term Noise Level Measurement

Site No.[1]	Site Description	Noise Level (dBA L_{eq})
S1	Located at northwest corner of Sun Microsystems building.	56
S2	Located at southwest corner of Sun Microsystems building.	49
S3	Located at southeast corner of Sun Microsystems building.	47
S4	Located at northeast corner of Sun Microsystems building.	58

Notes:
[1] Noise measurement locations shown in Exhibit 3-8.1.
Source: Veneklasen Associates, 2012.

Existing Vibration (Acceleration)

Veneklasen Associates measured ground vibration levels from train pass-bys at a distance of 100 feet from the railroad track, and the precise location is shown on Exhibit 3.9-1. Continuous vibration levels were recorded at one-second intervals from Tuesday January 17, 2012 to Tuesday January 24, 2012. Veneklasen Associates utilized an accelerometer magnetically attached to a ground spike driven into the existing soil. The accelerometer was connected to a Bruel & Kjaer 2250, which monitored and stored the measured acceleration levels. The equipment used was calibrated prior to and after completion of the measurements. Table 3.9-5 provides the measured vibration level.

Table 3.9-5: Site Monitor Locations and Measured Vibration Levels

Measurement Location	Description	Location	Vibration Level, (velocity) VdB
V1	Long-term vibration monitor	100 feet east of rail line	57

Note:
Vibration measurements taken from Tuesday, January 17, 2012 to Tuesday January 24, 2012.
Source: Veneklasen Associates, 2012.

Railroad Activity

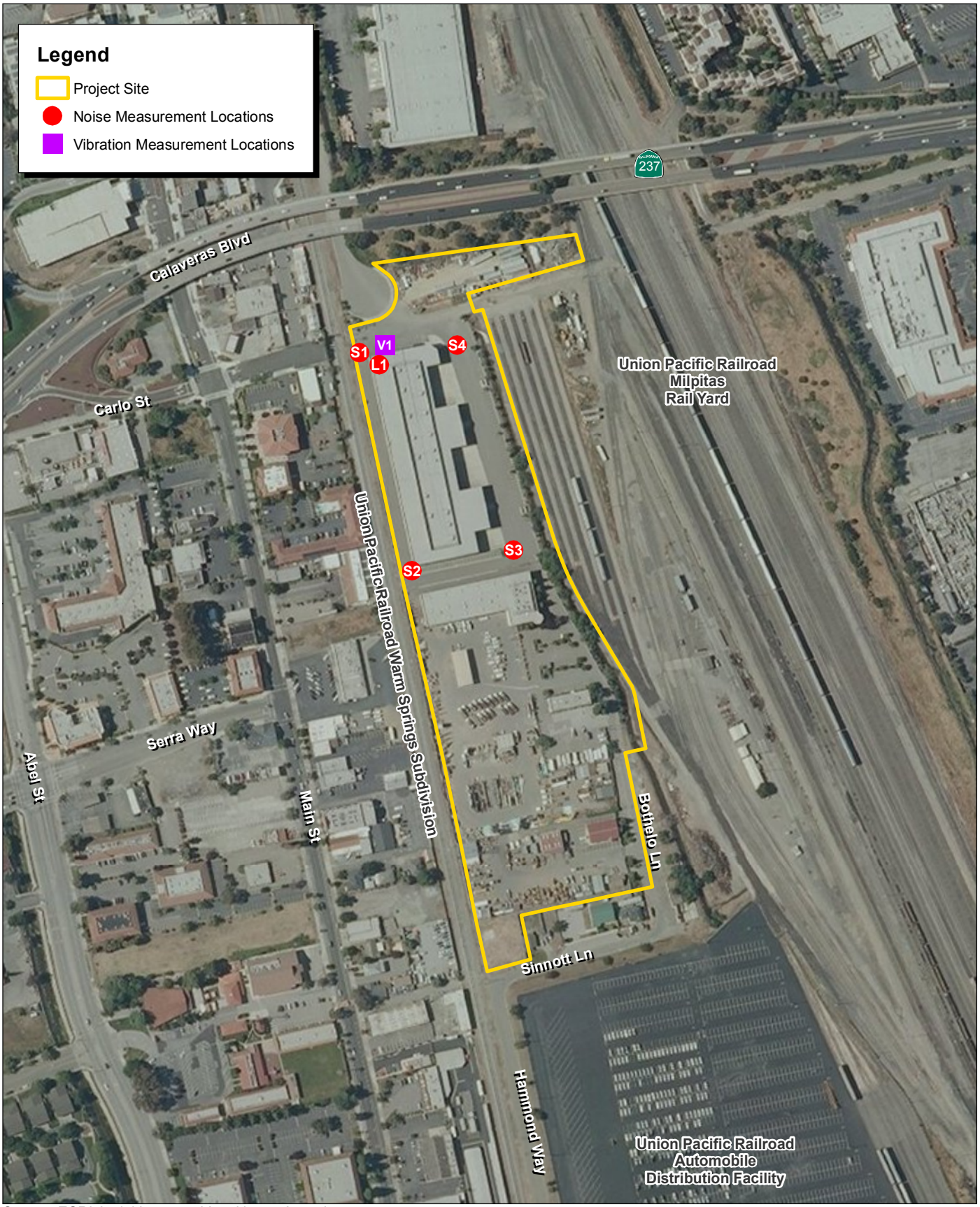
Veneklasen Associates recorded railroad activity over a period of 7 days. During this period, Veneklasen Associates documented 10 trains. Of the 10 train events recorded, all were freight trains. The freight trains observed were traveling at approximately 10 miles per hour (mph). Based on the observations and knowledge of the rail line, the recorded trains were freight trains usually consisting of a single locomotive and a few cars. For the rail line on the west side of the project site the frequency of train events is 1 to 2 per day. The long-term noise measurement found that a typical train event on the rail line to the west would create a maximum noise level of 76 dB L_{max}.

On the east side of the project site exists the Union Pacific Milpitas Rail Yard. Veneklasen Associates observed minimal activity in the yard, which consisted of less than one train per day moving at slow speeds and low noise levels.

3.9.3 - Regulatory Framework

Federal

The United States Department of Transportation, Federal Transit Administration, Office of Planning, "Transit Noise and Vibration Impact Assessment," contains the requirements for vibration levels related to exterior sound sources that potentially generate groundborne vibration. The criterion, presented in Table 8-1 of that report, is shown in Table 3.9-6. The FTA criterion is defined as the maximum revolutions per minute vibration velocity level with a one-second averaging time expressed in one-third octave band spectra. The FTA acknowledges that the development of this criterion is based on studies of rail transit systems. The FTA has suggestions of how to apply this criterion to freight trains as the duration of a pass-by is typically longer than a commuter train.



Source: ESRI Aerial Imagery, Veneklasen Associates.

Michael Brandman Associates

NORTH

326 163 0 326 Feet

Exhibit 3.9-1
Noise and Vibration Measurement Locations

Table 3.9-6: Ground-borne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (re: 10^{-6} inches per second		
	Frequent Events (> 70 events per day)	Occasional Events (30 to 10 events per day)	Infrequent Events (< 30 events per day)
Residences and buildings where people normally sleep	<72 VdB	<75 VdB	<80 VdB
Source: Federal Transit Administration, 2006.			

State

Office of Noise Control Standards

The California Office of Noise Control has set the land use compatibility noise standards and has encouraged local jurisdictions to adopt them. Pursuant to the land use compatibility noise standards, for commercial and industrial uses, noise levels up to 65 dBA CNEL are "normally acceptable;" noise levels between 65 and 75 dBA CNEL are "conditionally acceptable," which means that noise levels are acceptable only when a detailed noise analysis is conducted, and needed noise-insulation features are included in the design. Conventional construction with closed windows and a fresh-air supply system or air conditioning will normally suffice as "acceptable noise insulation" features. Noise levels between 70 and 80 dBA CNEL are generally unacceptable, and development of land uses in noise environments that exceed 75 dBA CNEL are discouraged. For residential development and schools, exterior noise levels ranging up to 60 dBA CNEL are classified as "normally acceptable," based upon the assumption that the homes are built with normal, conventional construction. Noise levels ranging from 55 to 70 dBA CNEL are conditionally acceptable. Noise levels in the 70- to 75-dBA CNEL range are classified as "generally unacceptable," and new construction or development is discouraged but may proceed if a detailed noise analysis is conducted, and needed noise-insulation features are included in the design.

Caltrans Vibration Guidance

Construction vibration is regulated in accordance with standards established by the Transportation and Construction-Induced Vibration Guidance Manual, issued by the California Department of Transportation (Caltrans). Table 3.9-7 presents these standards. Transient sources create a single, isolated vibration event, such as blasting or drop-ball impacts. Continuous/frequent intermittent sources include multiple impacts from pile drivers, the use of vibratory compaction equipment, and other construction equipment that creates vibration other than in single events.

Table 3.9-7: Groundborne Vibration Exposure Standards

Structure and Condition	Maximum Peak Particle Velocity (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic building, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and older residential structures with plaster walls and ceilings	0.50	0.25
New residential structures with gypsum board walls and ceilings	1.00	0.50
Modern commercial and industrial buildings	2.00	0.50
Source: California Department of Transportation, 2004.		

Local

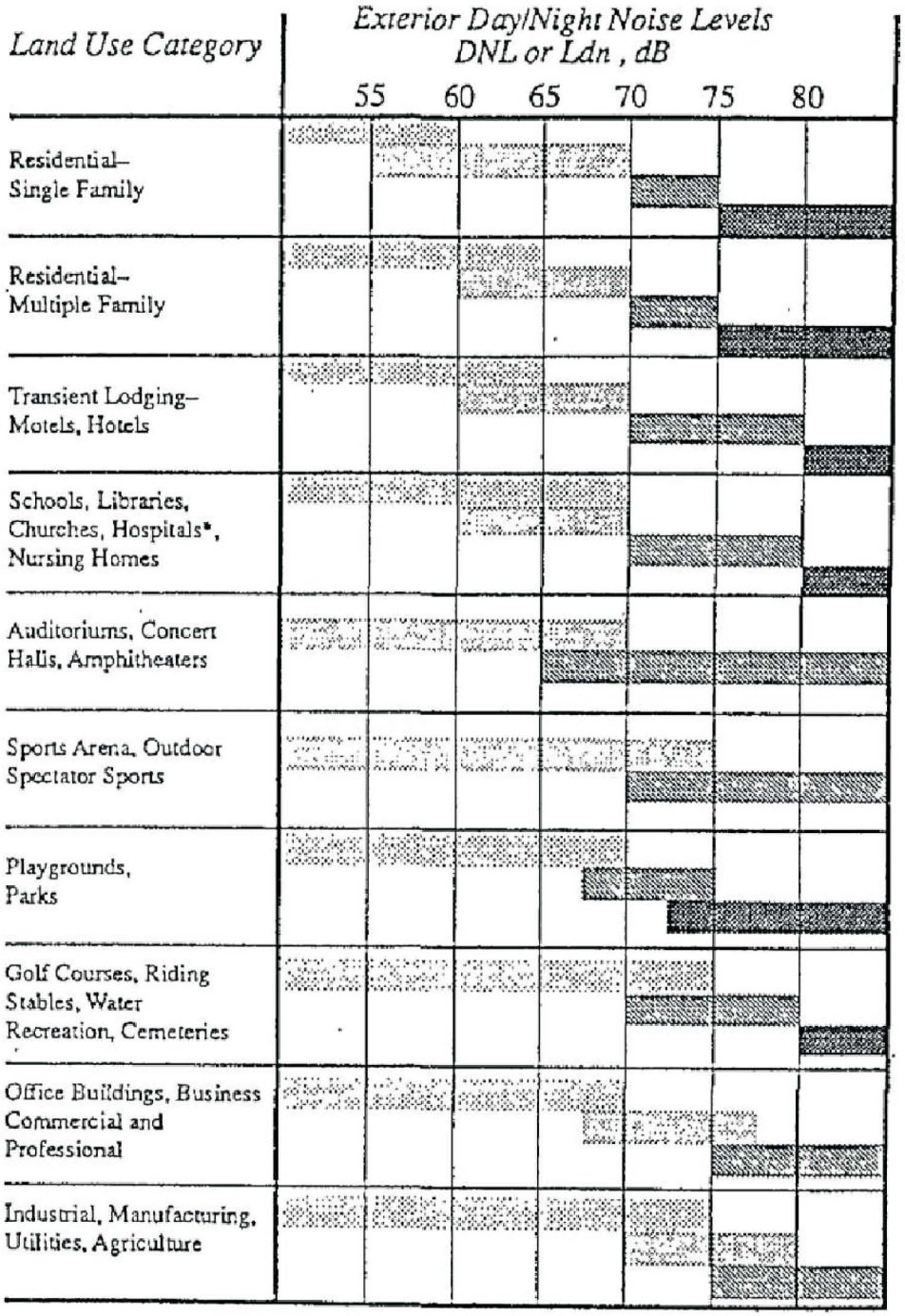
City of Milpitas

General Plan

The General Plan establishes the following goals and policies related to noise that are applicable to the proposed project:

- **Policy 6-I-1:** Use the guidelines in Table 6-1 (Noise and Land Use Compatibility) [as shown in Exhibit 3.9-2] as review criteria for development projects.
- **Policy 6-I-2:** Require an acoustical analysis for projects located within a "conditionally acceptable" or "normally unacceptable" exterior noise exposure area. Require mitigation measures to reduce noise to acceptable levels.
- **Policy 6-I-3:** Prohibit new construction where the exterior noise exposure is considered "clearly unacceptable" for the use proposed.
- **Policy 6-I-4:** Where actual or projected rear yard and exterior common open space noise exposure exceeds the "normally acceptable" levels for new single-family and multi-family residential projects, use mitigation measures to reduce sound levels in those areas to acceptable levels.
- **Policy 6-I-5:** All new residential development (single family and multifamily) and lodging facilities must have interior noise levels of 45 DNL or less. Mechanical ventilation will be required where use of windows for ventilation will result in higher than 45 dB DNL interior noise levels.
- **Policy 6-I-7:** Avoid residential DNL exposure increases of more than 3 dB or more than 65 dB at the property line, whichever is more restrictive.
- **Policy 6-I-13:** Restrict hours of operation, technique, and equipment used in all public and private construction activities to minimize noise impact. Include noise specifications in requests for bids and equipment information.

Table 6-1
Land Use Compatibility for Community Noise Environments



INTERPRETATION

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 generally 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: Office of Planning and Research, State of California General Plan Guidelines, Appendix A: Guidelines for the Preparation and Content of the Noise Element of the General Plan, 1990.

*Because hospitals are often designed and constructed with high noise insulation properties, it is possible for them to be satisfactorily located in noisier areas.

Source: City of Milpitas, 2002.

Exhibit 3.9-2
City of Milpitas
Land Use Compatibility Matrix

Michael Brandman Associates

Municipal Code

The following City ordinances are applicable to the proposed project:

- **Chapter V-213-3 Unlawful to Create or Permit Disturbing Noise.**
  (b) Site Construction Regulations. No person shall engage or permit others to engage in construction of any building or related road or walkway, pool or landscape improvement or in the construction operations related thereto, including, delivery or construction materials, supplies, or improvements on or to a construction site except within the hours of 7:00 a.m. to 7:00 p.m. on weekdays and weekends. No construction work shall be conducted or performed on the holidays indicated in Section V-213-2-2.05 of this chapter.

3.9.4 - Methodology

Veneklasen Associates prepared a noise study for the proposed project, which is provided in its entirety in Appendix F. Michael Brandman Associates also evaluated the proposed project's noise impacts through noise modeling of project-related traffic noise impacts on the nearby roadways. The analysis is provided below.

Measurement Procedure and Criteria

Veneklasen Associates conducted noise level monitoring to document ambient conditions, using Bruel & Kjaer 2260 Sound Level Meters, which satisfy the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Long-term noise readings were taken in L_{eq} 1-hour intervals with "A" frequency fast time weighting. A series of short-term noise measurements were also conducted on site. No unique or special events, such as high winds or construction activities, were noted during the monitoring periods.

Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise measurements of the current noise sources located on the project site and to provide a baseline for any potential noise impacts that may be created by development of the proposed project. The sites were shown previously in Exhibit 3.9-1.

RCNM Construction Noise Model

The Federal Highway Administration (FHWA) compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table 3.9-8 below provides a list of the construction equipment measured along with the associated measured noise emissions and measured percentage of typical equipment use per day. From this acquired data, the FHWA developed the Roadway Construction Noise Model (RCNM), which may be used for the prediction of construction noise for construction activities anticipated to have similar percentage of equipment use. For the purposes of this analysis, the RCNM, which uses the Spec 721.560 Lmax at 50 feet, will be used to calculate the onsite construction equipment noise emissions.

Table 3.9-8: Construction Equipment Noise Emissions and Usage Factors

Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 L_{max} @ 50 feet[2] (dBA, slow[3])	Actual Measured L_{max} @ 50 feet[4] (dBA, slow)
Backhoe	40	80	78
Compactor (ground)	20	80	83
Compressor (air)	40	80	78
Concrete Mixer Truck	40	85	79
Concrete Pump	20	82	81
Concrete Saw	20	90	90
Crane	16	85	81
Dozer	40	85	82
Dump Truck	40	84	76
Excavator	40	85	81
Flat Bed Truck	40	84	74
Front End Loader	40	80	79
Generator	50	82	81
Grader	40	85	N/A
Jackhammer	20	85	89
Paver	50	85	77
Pneumatic Tools	50	85	85
Pumps	50	77	81
Roller	20	85	80
Tractor	40	84	N/A
Welder/Torch	40	73	74

Notes:
1 Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
2 Spec 721.560 is the equipment noise level utilized by the Roadway Construction Noise Model program.
3 The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
4 Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006.

FHWA-RD-77-108 Traffic Noise Prediction Model

To predict existing and future noise levels due to traffic traveling 25 miles per hour or above, a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 was utilized. The FHWA-RD-77-108 Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level. Adjustments are then made to the reference energy mean emission level to account for the roadway active width (i.e., the distance

between the center of the outermost travel lanes on each side of the roadway); the total average daily traffic (ADT) and the percentage of ADT that flows during the day, evening, and night; the travel speed; the vehicle mix on the roadway; a percentage of the volume of automobiles, medium trucks, and heavy trucks; the roadway grade; the angle of view of the observer exposed to the roadway; and the site conditions ("hard" or "soft") as they relate to the absorption of the ground, pavement, or landscaping.

Traffic Noise Prediction Model Inputs

The roadway parameters used for this study are presented in Table 3.9-9. The roadway classifications are based on the City of Milpitas General Plan Circulation Element. The roadway speeds are based on the posted speed limits. The distance to the nearby sensitive receptor was determined by measuring the distance from the roadway centerline to the nearest residential use. Since the study area is located in a suburban environment and landscaping exists along the sides of all analyzed roadways, soft site conditions were modeled.

Table 3.9-9: FHWA Model Roadway Parameters

Roadway	Segment	General Plan Classification	Vehicle Speed (miles per hour)	Distance to Nearest Residence from Centerline (feet)
Abel Street	North of Marilyn Drive	Collector	35	60
Abel Street	North of Calaveras Boulevard	Collector	35	130
Abel Street	South of Curtis Avenue	Collector	35	60
Abel Street	South of Great Mall Parkway	Collector	35	130
Abel Street	North of Main Street	Collector	35	70
Abel Street	South of Main Street	Collector	35	60
Main Street	North of Weller Lane	Collector	30	50
Main Street	South of Weller Lane	Collector	30	55
Main Street	South of Curtis Avenue	Collector	35	50
Main Street	North of Great Mall Parkway	Collector	35	70
Main Street	South of Great Mall Parkway	Collector	35	65
Milpitas Boulevard	North of Calaveras Boulevard	Arterial	35	90
Marylinn Drive	East of Abel Street	Collector	30	50
Weller Lane	West of Main Street	Collector	25	60
Calaveras Boulevard	West of Abel Street	Arterial	35	60
Calaveras Boulevard	East of Abel Street	Arterial	40	150
Curtis Avenue	West of Main Street	Local	30	60
Curtis Avenue	East of Main Street	Local	30	45
Great Mall Parkway	West of Abel Street	Arterial	40	120
Source: City of Milpitas, 2002; Michael Brandman Associates, 2012.				

In order to determine the offsite project-generated traffic noise impacts, the average daily traffic volumes on the study area roadways were obtained from the Traffic Impact Analysis. The peak-hour volumes were provided for the existing year without and with phase 1 portion of project, and year 2035 without and with project scenarios. The ADT volumes were calculated by multiplying the PM peak-hour volumes by 12. The calculated ADT volumes are shown in Table 3.9-10.

Table 3.9-10: Average Daily Traffic

Roadway	Segment	Average Daily Traffic			
		Existing		Near Term	
		No Project	With Project	No Project	With Project
Abel Street	North of Marilyn Drive	18,250	18,320	19,540	19,610
Abel Street	North of Calaveras Boulevard	15,830	16,070	17,500	17,740
Abel Street	South of Curtis Avenue	17,200	17,640	20,600	21,050
Abel Street	South of Great Mall Parkway	14,540	14,690	16,740	16,880
Abel Street	North of Main Street	10,990	11,140	13,190	13,330
Abel Street	South of Main Street	15,920	16,120	20,500	20,690
Main Street	North of Weller Lane	4,600	5,110	4,600	5,110
Main Street	South of Weller Lane	5,390	5,660	5,390	5,660
Main Street	South of Curtis Avenue	10,140	10,360	12,230	12,440
Main Street	North of Great Mall Parkway	12,860	13,080	14,950	15,170
Main Street	South of Great Mall Parkway	5,660	5,710	8,040	8,090
Milpitas Boulevard	North of Calaveras Boulevard	18,080	18,120	19,300	19,330
Marylinn Drive	East of Abel Street	5,480	5,560	5,480	5,560
Weller Lane	West of Main Street	2,950	3,190	2,950	3,190
Calaveras Boulevard	West of Abel Street	46,620	46,970	53,770	53,880
Calaveras Boulevard	East of Abel Street	51,070	51,250	56,860	57,040
Curtis Avenue	West of Main Street	3,850	4,300	3,850	4,300
Curtis Avenue	East of Main Street	5,410	6,070	5,410	6,070
Great Mall Parkway	West of Abel Street	32,340	32,640	34,850	35,150
Source: Hexagon Transportation Consultants, Inc., 2012; Michael Brandman Associates, 2012.					

Table 3.9-11 presents the hourly traffic flow distributions (vehicle mixes) used in this analysis. These distributions were obtained from Caltrans and from field observations of similar collector and arterial roads. The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the FHWA Model.

Table 3.9-11: Nearby Roadway Vehicle Mixes

Roadway Classification	Vehicle Type	Percent of Hourly Distribution			
		Day (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)	Overall
Local and Collector	Automobiles	73.6	13.6	10.2	97.4
	Medium Trucks	0.9	0.9	0.0	1.8
	Heavy Trucks	0.4	0.0	0.4	0.7
Arterials	Automobiles	69.5	12.9	9.6	92.0
	Medium Trucks	1.4	0.1	1.5	3.0
	Heavy Trucks	2.4	0.1	2.5	5.0
SR-237	Automobiles	66.5	13.6	15.9	96.0
	Medium Trucks	1.2	0.2	0.6	2.0
	Heavy Trucks	1.1	0.1	0.8	2.0
Source: California Department of Transportation, 2011; Michael Brandman Associates, 2012.					

In order to determine the height above the road grade from where the noise is being emitted, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires, and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

Source Assumptions

To assess the roadway noise generation in a uniform manner, all vehicles were analyzed at the single-lane-equivalent acoustic center of the roadway being analyzed, which means that all lanes were analyzed as one lane located at the centerline of the roadway, instead of analyzing each lane in the roadway as a separate noise source. The width of each single-lane equivalent was based on the right-of-way and near-far lane length s (i.e., the distance between the middle lines of each outside lane) as determined by the General Plan Roadway Classifications. In order to determine the height above the road grade from where the noise is being emitted, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires, and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

3.9.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, noise impacts resulting from the implementation of the proposed project would be considered significant if the project would cause:

a) 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?

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

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

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

e) 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, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found Not To Be Significant.)

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found Not To Be Significant.)

Offsite Noise Level Standards

Construction-Related Noise Standard

Pursuant to Chapter V-213-3 of the City of Milpitas Municipal Code, construction noise is restricted from occurring between 7:00 p.m. and 7:00 a.m. on weekdays and weekends and no construction noise is allowed on holidays. Since some construction activities could result in noise levels that could cause harm to persons such as residents or workers, a noise threshold utilizing the OSHA agency limits of noise exposure is used. The use of a significance threshold using an OSHA standard is considered conservative. The OSHA standard is limiting noise exposure of workers to 90 dB or less over 8 continuous hours. Typical construction activities result in a range of noise levels from operating various pieces of equipment. Typical equipment operating cycles may be used at a full power setting followed by a lower setting. Therefore, noise levels fluctuate during construction activities. For the purpose of this noise impact analysis, noise levels that could expose residents or workers to more than 90 dB for over 8 continuous hours are considered a significant noise impact.

Transportation-Related Noise Standards

Pursuant to Policy 6-I-7 of the City of Milpitas General Plan, an offsite transportation noise impact would occur if the proposed project would increase the noise level at any nearby residential use by 3 dB or more than 65 dB at the property line, whichever is more restrictive.

Onsite Noise Level Standards

Exterior Noise Standards

Pursuant to Policy 6-I-4 of the City of Milpitas General Plan, an onsite exterior noise impact would occur if the noise level at the exterior common open space would exceed 60 dB L_{dn} for the proposed single-family residential uses and 65 dB L_{dn} for the proposed multi-family residential uses.

Pursuant to Policy 6-I-1 of the City of Milpitas General Plan, an onsite exterior noise impact would occur if the noise level at the proposed park would exceed 70 dB L_{dn}.

Interior Noise Standards

Pursuant to Policy 6-I-5 of the City of Milpitas General Plan, an onsite interior noise impact would occur if the interior of the proposed single-family and multi-family residential units would exceed 45 dB L_{dn}. Policy 6-I-5 also requires mechanical ventilation where use of windows for ventilation (open windows) will result in higher than 45 dB L_{dn} interior noise levels.

Vibration Level Standards

The City of Milpitas does not have regulations that define acceptable levels of vibration. One reference suggesting vibration standards is the Federal Transit Administration (FTA) publication concerning noise and vibration impact assessment from transit activities. Although the FTA guidelines are to be applied to transit activities, they may be reasonably applied to the assessment of the potential for annoyance or structural damage resulting from other activities. To prevent vibration annoyance in residences, a vibration velocity level of 80 VdB or less is suggested when there are fewer than 70 vibration events per day. (80 VdB is the appropriate standard for the nearby Union Pacific Railroad tracks, due to the infrequent nature of rail movements.) A level of 100 VdB or less is suggested by the FTA guidelines to prevent damage to fragile buildings.

3.9.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the proposed project and provides mitigation measures where appropriate.

Noise Levels in Excess of Standards

Impact NOI-1:	**The proposed project may 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.**

Impact Analysis

This impact will assess whether the proposed project may expose persons to excessive noise levels associated with offsite construction noise, non-transportation noise and traffic noise, which are the most common noise sources associated with urban development. This impact also assess whether the proposed project may expose persons to excessive noise levels onsite. Each topic is discussed separately below.

Offsite Impacts

This discussion will assess the proposed project's potential to adversely affect surrounding land uses with noise generated within the project boundaries (i.e., construction noise and operational non-transportation noise) and noise generated by project-related vehicle trips (i.e., transportation noise).

Construction Noise

Construction noise represents a short-term increase in ambient noise and vibration levels. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. In order for construction-related noise impacts created by the proposed project to be considered potentially significant, construction activities would need to occur between 7:00 p.m. and 7:00 a.m., or the noise level at the nearby residential uses would have to exceed the OSHA 8-hour standard of 90 dBA L_{eq}.

The nearest noise sensitive land uses to the project site is a single-family residence at 87 Sinnott Lane, which is as near as 5 feet from the project site, a church located at 121 Sinnott Lane, which is as near as 8 feet from the project site, and a multi-family residence at 133 Sinnott Lane, which is as near as 20 feet from the project site.

Construction noise impacts onto the nearby sensitive receptors have been calculated according to the equipment noise levels listed above in Table 3.9-8 and through the use of the Roadway Construction Noise Model. The greatest noise impacts to the nearby sensitive receptors would be anticipated to occur during the grading of the project site. Construction noise has been modeled based on the equipment assumption used in Section 3.3, Air Quality/Greenhouse Gases, which assumed that the simultaneous operation of one grader; one dozer; one water truck; and one of either a tractor, loader, or backhoe would occur during the grading phase for the proposed project. The equipment was placed 50 feet apart starting at the property line in order to create the worst-case noise levels at the nearby sensitive receptors. A summary of the results of the noise impacts associated with the construction of the proposed project is shown in Table 3.9-12, and the Roadway Construction Noise Model printouts are provided in Appendix F.

Table 3.9-12: Construction Noise Impacts at Nearby Receptors Prior to Mitigation

Receptor Description	Distance from Project Site (feet)	Grading Equipment Noise Levels[1]	
		dBA L_{eq}	dBA L_{max}
Single-family residential (87 Sinnott Lane)	5	101	105
Church (121 Sinnott Lane)	8	94	98
Multi-family residential (133 Sinnott Lane)	20	89	93

Notes:
[1] L_{max} is based on the maximum noise from the loudest piece of equipment and the L_{eq} is the average noise from all equipment.
Source: Michael Brandman Associates, 2012.

Table 3.9-12 shows that the single-family residence at 87 Sinnott Lane adjacent to the south side of the project site would experience the greatest construction noise impact from the proposed project, with an average construction-related noise level of 101 dBA L_{eq} and a maximum noise level of 105 dBA L_{max}. The construction noise levels would exceed the 90 dBA L_{eq} standard at the nearby residential uses. This would be considered a significant impact.

Mitigation Measure NOI-1a is provided that would restrict when construction may occur, require the use of noise reduction features on equipment, limit placement of construction staging areas, and require the installation of a 10-foot high temporary sound wall along the southern edge of the project site that covers all of the shared property lines with 87 Sinnott Lane, 121 Sinnott Lane, and 133 Sinnott Lane.

The construction noise levels have been recalculated based on construction of the temporary 10-foot high sound wall on the south side of the project site. The attenuation from the proposed walls were based on the noise barrier equations provided in the Caltrans Technical Noise Supplement and based on the construction equipment at 10 feet in elevation and the receiver at 5 feet in elevation. The mitigated construction noise impacts at the nearby homes are shown below in Table 3.9-13 and the calculations are shown in Appendix F.

Table 3.9-13: Mitigated Construction Noise Impacts at Nearby Receptors

Receptor Description	Distance from Project Site (feet)	Grading Equipment Noise Levels[1]	
		dBA L_{eq}	dBA L_{max}
Single-family residential (87 Sinnott Lane)	5	88	92
Church (121 Sinnott Lane)	8	83	87
Multi-family residential (133 Sinnott Lane)	20	81	85

Notes:
[1] L_{max} is based on the maximum noise from the loudest piece of equipment and the L_{eq} is the average noise from all equipment.
Source: Michael Brandman Associates, 2012.

As indicated in Table 3.9-13, with implementation of Mitigation Measure NOI-1a, the project will provide noise-suppression techniques to minimize the impact of temporary construction noise and avoid possible violations of local and state standards. In addition, the proposed project will require the installation of noise reduction features (e.g., mufflers and engine shrouds) on construction equipment that are no less effective than those originally installed by the manufacturer. Implementation of Mitigation Measure NOI-1a, construction noise levels at the nearby sensitive receptors would be reduced to meet the OSHA 90 dB standard. Therefore, with implementation of Mitigation Measure NOI-1a, construction nose impacts would be reduced to a level of less than significant.

Operational Non-Transportation Noise

The proposed project is a residential land use and, therefore, would not be a significant source of non-transportation noise (industrial machinery, loading and unloading activities, public address systems, etc.) that could adversely affect surrounding land uses. As such, no impacts would occur.

Operational Transportation Noise

In order for offsite roadway noise impacts created by the proposed project's operations to be considered potentially significant, the proposed project would need to increase the noise level at any nearby residential use by 3 dB or more than 65 dB at the property line, whichever is more restrictive.

In order to quantify the traffic noise impacts along the analyzed roadways, the roadway noise contours were calculated. Noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway. For analysis comparison purposes, the L_{dn} and CNEL noise levels are calculated at the distance to the nearest residential use, which was determined from aerial photos of the study area. In addition, the distance from the centerline to the 55-, 60-, 65-, and 70-dBA noise levels are calculated for both L_{dn} and CNEL standards and are shown in the noise calculation spreadsheets provided in Appendix F. The proposed project's offsite traffic noise impacts have been analyzed for the existing and background conditions and are discussed below.

Existing Conditions

The proposed project's potential offsite traffic noise impacts have been calculated through a comparison between the existing without-project scenario and the existing with-project scenario. The results of this comparison are shown in Table 3.9-14.

Table 3.9-14: Existing Scenario Project Traffic Noise Contributions

Roadway	Segment	dBA L_{dn} at Nearest Receptor[1]			
		No Project	With Project	Project Contribution	Potential Significant Impact?
Abel Street	North of Marilyn Drive	64	64	0	No
Abel Street	North of Calaveras Boulevard	58	58	0	No
Abel Street	South of Curtis Avenue	63	63	0	No
Abel Street	South of Great Mall Parkway	57	57	0	No
Abel Street	North of Main Street	60	60	0	No
Abel Street	South of Main Street	63	63	0	No
Main Street	North of Weller Lane	57	57	0	No
Main Street	South of Weller Lane	57	57	0	No
Main Street	South of Curtis Avenue	62	62	0	No
Main Street	North of Great Mall Parkway	61	61	0	No

Table 3.9-14 (cont.): Existing Scenario Project Traffic Noise Contributions

Roadway	Segment	dBA L_{dn} at Nearest Receptor[1]			
		No Project	With Project	Project Contribution	Potential Significant Impact?
Main Street	South of Great Mall Parkway	58	58	0	No
Milpitas Boulevard	North of Calaveras Boulevard	62	62	0	No
Marylinn Drive	East of Abel Street	58	58	0	No
Weller Lane	West of Main Street	51	52	0	No
Calaveras Boulevard	West of Abel Street	69	69	0	No
Calaveras Boulevard	East of Abel Street	65	65	0	No
Curtis Avenue	West of Main Street	55	55	0	No
Curtis Avenue	East of Main Street	58	59	1	No
Great Mall Parkway	West of Abel Street	64	64	0	No

Notes:
[1] Distance to nearest residential uses shown in Table 3.9-9.
Source: Michael Brandman Associates, 2012.

Table 3.9-14 above shows that compared with existing conditions, noise level contributions from the proposed project to the study area roadways would range from 0 to 1 dBA L_{dn}. In this scenario, the project would only increase the noise level on Curtis Avenue east of Main Street by 1 dB, however the resultant noise level at the nearest residence to this roadway segment would remain below the City's 65 dB L_{dn} standard. Therefore, a less than significant would occur from operational transportation noise for the existing scenario.

Background Conditions

The background conditions comprise of existing traffic counts plus traffic generated by other approved developments in the vicinity of the site. The proposed project's potential offsite traffic noise impacts have been calculated through a comparison between the background without-project scenario and the background with-project scenario. The results of this comparison are shown in Table 3.9-15.

Table 3.9-15: Background Scenario Project Traffic Noise Contributions

Roadway	Segment	dBA L_{dn} at Nearest Receptor[1]			
		No Project	With Project	Project Contribution	Potential Significant Impact?
Abel Street	North of Marilyn Drive	64	64	0	No
Abel Street	North of Calaveras Boulevard	58	58	0	No
Abel Street	South of Curtis Avenue	64	64	0	No
Abel Street	South of Great Mall Parkway	58	58	0	No
Abel Street	North of Main Street	61	61	0	No
Abel Street	South of Main Street	64	64	0	No
Main Street	North of Weller Lane	57	57	0	No
Main Street	South of Weller Lane	57	57	0	No
Main Street	South of Curtis Avenue	63	63	0	No
Main Street	North of Great Mall Parkway	62	62	0	No
Main Street	South of Great Mall Parkway	59	59	0	No
Milpitas Boulevard	North of Calaveras Boulevard	62	62	0	No
Marylinn Drive	East of Abel Street	58	58	0	No
Weller Lane	West of Main Street	51	52	0	No
Calaveras Boulevard	West of Abel Street	70	70	0	No
Calaveras Boulevard	East of Abel Street	65	65	0	No
Curtis Avenue	West of Main Street	55	55	0	No
Curtis Avenue	East of Main Street	58	59	1	No
Great Mall Parkway	West of Abel Street	64	64	0	No

Note:
[1] Distance to nearest residential uses shown in Table 3.9-9.
Source: Michael Brandman Associates, 2012.

Table 3.9-15 above shows that compared with background conditions, noise level contributions from the proposed project to the study area roadways would range from 0 to 1 dBA L_{dn}. In this scenario, the project would only increase the noise level on Curtis Avenue east of Main Street by 1 dB, however the resultant noise level at the nearest residence to this roadway segment would remain below the City's 65 dB L_{dn} standard. Therefore, a less than significant would occur from operational transportation noise for the background scenario.

Onsite Impacts

This discussion will assess the noise impacts from the nearby roadways and railroads to the proposed exterior common areas and interior of the proposed residential uses.

Exterior Residential Common Area Noise Impacts

An onsite exterior noise impact would occur if the noise level at the exterior common open space would exceed 60 dB L_{dn} for the proposed single-family residential uses and 65 dB L_{dn} for the proposed multi-family residential uses. The northern half of the project site is proposed to contain single-family homes and the southern half of the project site is proposed to contain multi-family homes.

To determine the potential exterior residential common area noise impacts, the noise levels to the nearest exterior residential common area for each side of the project site was calculated and described below.

Residences on North Side

The north side of the project site is primarily impacted by noise from Calaveras Boulevard, which is as near as 300 feet from the proposed single-family residential exterior common areas. Veneklasen Associates calculated that for the year 2030, the proposed northernmost residences would experience an exterior noise level of 64 dB L_{dn}. This would exceed the City's 60 dB L_{dn} single-family residential exterior noise threshold and would be considered a significant impact.

Mitigation Measure NOI-1b is provided that would require the installation of minimum 6-foot high sound walls around the perimeter of single-family Residential units 1, 6, and 7 which represent the northernmost proposed residential lots. Veneklasen Associates found that through implementation of Mitigation Measure NOI-b, the exterior noise levels would be reduced to less than significant for the single-family residences on the north side of the project site.

Residences on East Side

The proposed project would include both single-family and multi-family residential units along the eastern area of the project site. The Union Pacific Milpitas Rail Yard is adjacent to the east side of the project site. Veneklasen Associates observed minimal activity in the yard, which consisted of less than one train per day moving at slow speeds and low noise levels and currently the noise levels on the east side do not exceed either the City's 60 dB L_{dn} single-family exterior noise standard or 65 dB L_{dn} multi-family exterior noise standard.

The Bay Area Rapid Transit (BART) system will be extended from Warm Springs (Fremont) to Berryessa (San Jose) parallel to the east side of the Milpitas Rail Yard and is anticipated to start service in late 2016 or early 2017. The BART tracks will be approximately 530 feet east of the project site. According to Santa Clara Valley Transportation Authority, BART trains will travel at 67 miles per hour in the vicinity of the project site and will create an exterior noise level that exceeds 65 dB L_{dn} at the residences located 280 feet west of the BART line on Berryessa Street (approximately 2,000 feet north of the project site). The residential portion of the project site is located approximately as near as 530 feet west of the proposed BART line, based on a standard hard-site line source drop-off rate of 3 dB per doubling of distance, this results in a noise level of 63 dBA L_{dn} at the

eastern property line. This would exceed the City's 60 dB L_{dn} single-family residential exterior common area noise thresholds and would be considered a significant impact.

Mitigation Measure NOI-1b is provided that would require the installation of a minimum 6-foot high sound wall along the eastern property line, in either of the proposed locations provided in Exhibit 3.9-3. The wall height was calculated based on the noise barrier equations provided in the Caltrans Technical Noise Supplement and based on the rail noise at 12 feet in elevation and the receiver at 5 feet in elevation, which resulted in a noise level of 59 dBA L_{dn}. Therefore, the proposed 6-foot high wall would reduce the exterior common area noise level to less than the single-family residential exterior common area standard of 60 dB L_{dn}.

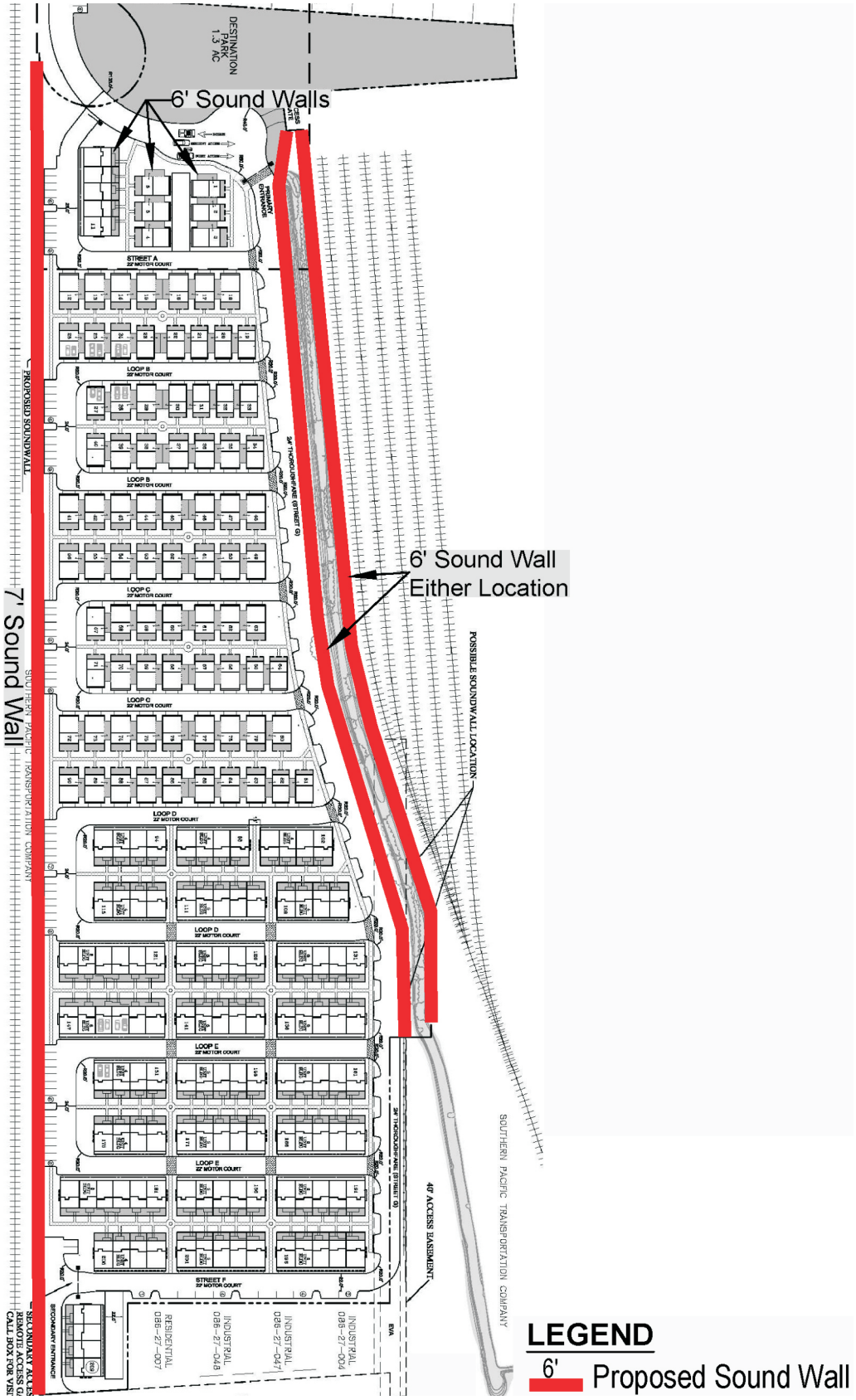
Residences on South Side

The south side of the proposed project is bordered by residential and church uses. There are no major noise sources located on the south side of the project site that would cause an exceedance to the City's exterior residential common area noise standards. Impacts would be less than significant.

Residences on West Side

The proposed project would include both single-family and multi-family residential units along the western area of the project site. The Union Pacific Railroad Warm Springs Subdivision is located approximately 30 feet west of the project site. Veneklasen Associates recorded railroad activity on this railroad over a period of 7 days. During this period, Veneklasen Associates documented 10 trains or 1 to 2 trains per day. Of the 10 train events recorded, all were freight trains. The freight trains observed were traveling at approximately 10 miles per hour (mph). Based on the observations and knowledge of the railroad, the recorded trains were freight trains usually consisting of a single locomotive and a few cars. The long-term noise measurement found that a typical train event on the railroad to the west would create a maximum noise level of 76 dB L_{max}. The long-term noise measurement was located on the northwest corner of the existing Sun Microsystems building, which is located on the project site approximately 65 feet east of the railroad and recorded a noise level of 63 dBA $L_{dn.}$ Although, the long-term noise measurement captured noise from several sources, in order to provide a worst-case analysis, it has been assumed that the railroad created the 63 dBA L_{dn}. Based on a standard hard-site line source drop-off rate of 3 dB per doubling of distance, this results in a noise level of 66 dBA L_{dn} at the western property line. This would exceed the City's 60 dB L_{dn} single-family and 65 dB L_{dn} multi-family residential exterior noise thresholds and would be considered a significant impact.

Mitigation Measure NOI-1b is provided that would require the installation of a minimum 7-foot high sound wall along the western property line. The wall height was calculated based on the noise barrier equations provided in the Caltrans Technical Noise Supplement and based on the rail noise at 12 feet in elevation and the receiver at 5 feet in elevation, which resulted in a noise level of 58 dBA L_{dn}.



Source: Ruggeri-Jensen-Azar, 2012.

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Exhibit 3.9-3
Proposed Sound Wall Locations

Therefore, the proposed 7-foot high wall would reduce the exterior common area noise level to less than the single-family residential exterior common area standard of 60 dB L_{dn}.

Exterior Park Area Noise Impacts

An onsite exterior noise impact would occur if the noise level at the exterior park area would exceed 70 dB L_{dn}. Veneklasen Associates calculated that for the year 2030, the proposed park on the northernmost portion of the project site would experience an exterior noise level of less than 60 dB L_{dn}. This would not exceed the City's 70 dB L_{dn} exterior park noise threshold. Impacts would be less than significant.

Interior Noise Levels

An interior noise impact would occur if the noise level at the interior of the proposed single-family and multi-family homes would exceed 45 dB L_{dn}. Common construction practices achieve outdoor to indoor noise reductions of approximately 15 dB with windows open and approximately 20 dB with windows closed. Therefore, areas exposed to outdoor noise levels less than 60 dB L_{dn} will satisfy the interior noise requirement without special acoustical construction. For situations where the exterior noise exceeds 60 dB L_{dn}, the City requires that mechanical ventilation be provided to allow for the residents to maintain adequate circulation and temperature levels without opening windows. Therefore, areas exposed to outdoor noise levels less than 65 dB L_{dn} will satisfy the interior noise requirement by providing mechanical ventilation.

To determine the potential residential interior noise impacts, the noise levels at the nearest residential area for each side of the project site was calculated and described below.

Residences on North Side

The above analysis found that the proposed single-family homes on the north side of the project site would experience exterior noise levels as high as 64 dB L_{dn}. This would result in interior noise levels as high as 49 dB L_{dn} for the windows open condition and 44 dB L_{dn} for the windows closed condition. This would be considered a significant impact for the windows open condition.

Mitigation Measure NOI-1c is provided that would require mechanical ventilation to be installed in all proposed residential units. Implementation of Mitigation Measure NOI-c would reduce the proposed residences interior noise levels to less than the City's interior residential noise standard of 45 dB L_{dn}.

Residences on East Side

The above analysis found that the proposed single-family and multi-family homes on the east side of the project site would experience exterior noise levels as high as 63 dB L_{dn}. This would result in interior noise levels as high as 48 dB L_{dn} for the windows open condition and 43 dB L_{dn} for the windows closed condition. This would be considered a significant impact for the windows open condition.

Mitigation Measure NOI-1c is provided that would require mechanical ventilation to be installed in all proposed residential units. Implementation of Mitigation Measure NOI-c would reduce the proposed residences on the east side interior noise levels to less than the City's interior residential noise standard of 45 dB L_{dn}.

Residences on South Side

The south side of the proposed project is bordered by residential and church uses. There are no major noise sources located on the south side of the project site that would cause an exceedance to the City's exterior residential common area noise standards and resultant interior residential noise standards. Impacts would be less than significant.

Residences on West Side

The above analysis found that the railroad on the west side would create a noise level as high as 63 dB L_{dn} at 65 feet east of the railroad. The proposed residences are as near as 55 feet east of the railroad. Based on a standard hard-site line source drop-off rate of 3 dB per doubling of distance, the proposed single-family and multi-family homes on the west side of the project site would experience exterior noise levels as high as 64 dB L_{dn}. This would result in interior noise levels as high as 48 dB L_{dn} for the windows open condition and 43 dB L_{dn} for the windows closed condition. This would be considered a significant impact for the windows open condition.

Mitigation Measure NOI-1c is provided that would require mechanical ventilation to be installed in all proposed residential units. Implementation of Mitigation Measure NOI-c would reduce the proposed residences on the west side interior noise levels to less than the City's interior residential noise standard of 45 dB L_{dn}.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM NOI-1a During construction activities the project applicant shall require construction contractors to adhere to the following noise attenuation requirements:

- Construction activities shall be limited to the hours between 7 a.m. to 7 p.m. Construction activities shall not occur on holidays. The City of Milpitas shall have the discretion to permit construction activities to occur outside of allowable hours or on federal holidays if compelling circumstances warrant such an exception (e.g., weather conditions necessary to pour concrete).
- All construction equipment shall use noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. If no noise reduction features were installed by the

manufacturer, then the contractor shall require that at least a muffler be installed on the equipment.

- Construction staging and heavy equipment maintenance activities shall be performed a minimum distance of 300 feet from the nearest residence or church, unless safety or technical factors take precedence (e.g., a heavy equipment breakdown).
- A minimum 10-foot high temporary noise barrier shall be placed along the shared property line with 87 Sinnott Lane, 121 Sinnott Lane, and 133 Sinnott Lane. The temporary noise barrier shall be installed prior to commencement of demolition activities and shall not be removed until completion of grading activities. The noise barrier shall be constructed with a minimum of ½-inch plywood or OSB.

MM NOI-1b Prior to issuance of building permits, the project applicant shall prepare and submit plans to the City of Milpitas depicting the sound walls detailed below and depicted on Exhibit 3.9-3. Each sound wall shall be free of cutouts or openings and constructed of wood, concrete, stud and stucco, plate glass, plexiglass, or vinyl and have a surface density of at least 2 pounds per square foot.

- Minimum 6-foot high sound walls shall be placed around the perimeter of all private yards for the northernmost residential Lots 1, 6, and 7.
- A minimum 6-foot high sound wall, berm or combination thereof along the eastern property line, in either of the proposed locations provided in Exhibit 3.9-3.
- A minimum 7-foot high sound wall, berm or combination thereof along the western property line.

MM NOI-1c Prior to issuance of building permits, the project applicant shall prepare and submit plans to the City of Milpitas for review and approval demonstrating that all residences would be constructed with a mechanical ventilation system.

Level of Significance After Mitigation

Less than significant impact.

Excessive Groundborne Vibration

Impact NOI-2:	**The proposed project would not result in exposing persons to or generation of excessive groundborne vibration or groundborne noise levels.**

Impact Analysis

The City of Milpitas does not have regulations that define acceptable levels of vibration. One reference suggesting vibration standards is the Federal Transit Administration (FTA) publication concerning noise and vibration impact assessment from transit activities. Although the FTA guidelines are to be applied to transit activities, they may be reasonably applied to the assessment of

the potential for annoyance or structural damage resulting from other activities. To prevent vibration annoyance in residences, a vibration velocity level of 80 VdB or less is suggested when there are fewer than 70 vibration events per day. (80 VdB is the appropriate standard for the nearby Union Pacific Railroad tracks, due to the infrequent nature of rail movements.) A level of 100 VdB or less is suggested by the FTA guidelines to prevent damage to fragile buildings.

Offsite Vibration

Vibration from construction activities could occasionally be perceptible at the closest sensitive land uses. The primary vibratory sources during construction activities within the project area would likely be large bulldozers or excavators and loaded trucks. Typical bulldozer or loaded truck activities generate an approximate vibration level of 86 to 87 VdB at a distance of 25 feet. Most sensitive uses would be located at distances greater than 25 feet from major vibratory sources. Typically, vibration levels must exceed 80 VdB before annoyance occurs or 100 VdB before building damage occurs.

The closest vibration-sensitive land uses are the single-family homes on the north side of Bothelo Avenue, with the nearest structure located approximately 45 feet from the proposed area to be disturbed during construction. It is anticipated that the vibration levels caused by a large bulldozer operating on the project site would create a vibration level at the nearest structure of less than 80 VdB. This vibration level would not exceed the 80-VdB threshold for annoyance or the 100-VdB threshold for damage to fragile buildings. Therefore, construction-related vibration impacts would be less than significant.

Onsite Vibration

Exhibit 3.9-4 depicts 90th percentile vibration levels at Location V1 (refer to Exhibit 3.9-1), which would be the onsite receptor most susceptible to adverse exposure from Union Pacific Railroad rail movements The measured groundborne vibration at the project site was 57 VdB, which is below the maximum 80-VdB standard as defined by the U.S. Department of Transportation, Federal Transit Administration, Office of Planning, "Transit Noise and Vibration Impact Assessment." As such, onsite vibration impacts would be less than significant.

Level of Significance Before Mitigation

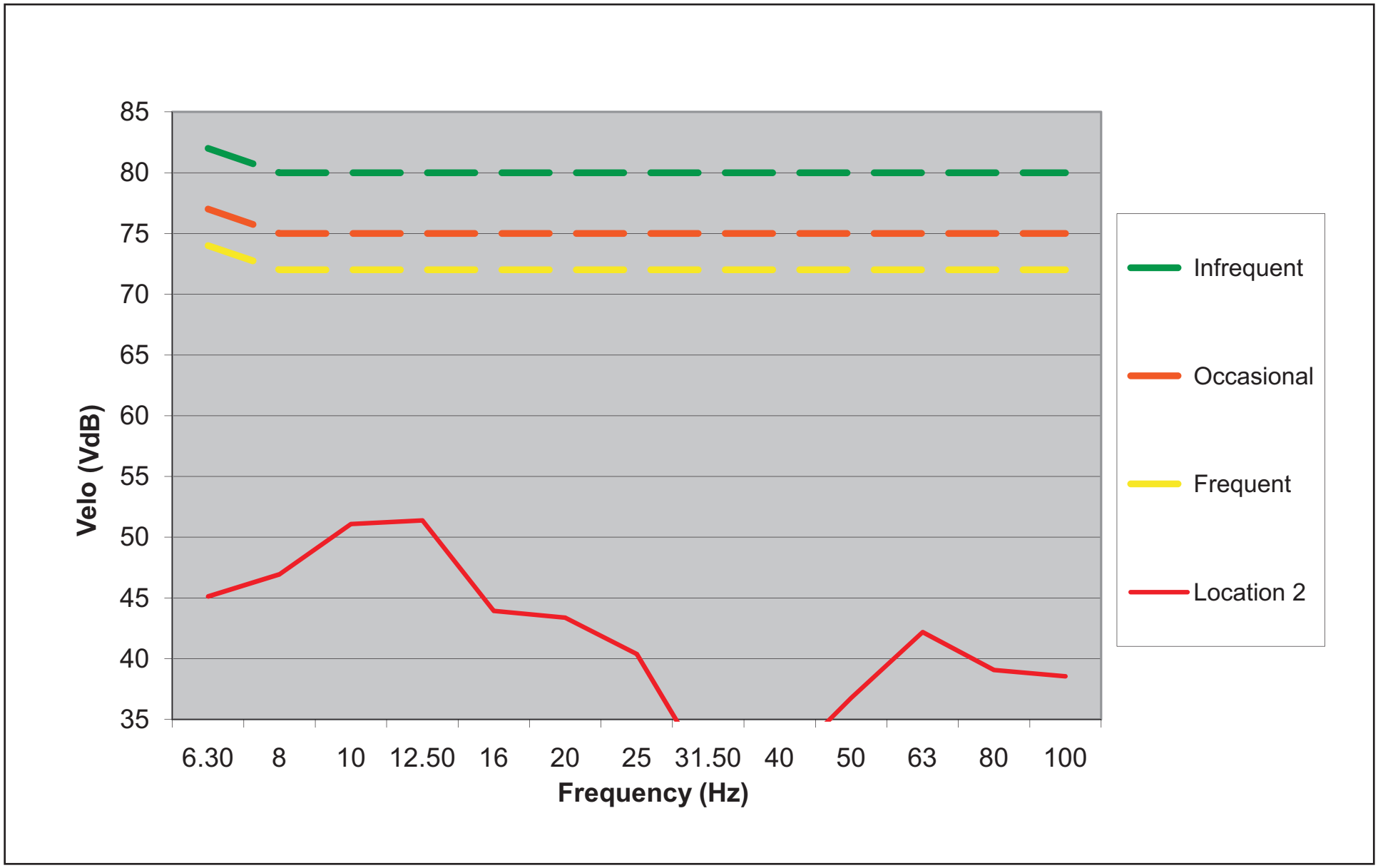
Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.



Source: Veneklasen Associates.

NORTH

Michael Brandman Associates

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Exhibit 3.9-4
90th Percentile Vibration Levels at Location V1

Permanent Increase in Ambient Noise

Impact NOI-3:	**The proposed project would not result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.**

Impact Analysis

As discussed in Impact NOI-1, sensitive land uses located along roadways in the project vicinity would not be exposed to substantial permanent increases in ambient noise levels. Furthermore, the proposed project is residential in nature and, as such, is not a significant source of non-transportation noise. As such, the proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Temporary or Periodic Increase in Ambient Noise Levels

Impact NOI-4:	**The proposed project may result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.**

Impact Analysis

In order for construction-related noise impacts created by the proposed project to be considered potentially significant, construction activities would need to occur between 7:00 p.m. and 7:00 a.m., or the noise level at the nearby residential uses would have to exceed the OSHA 8-hour standard of 90 dBA L_{eq}.

As discussed in Impact NOI-1, the analysis found that the single-family residence at 87 Sinnott Lane adjacent to the south side of the project site would experience the greatest construction noise impact from the proposed project, with an average construction-related noise level of 101 dBA L_{eq} and a maximum noise level of 105 dBA L_{max}. The construction noise levels would exceed the 90 dBA L_{eq} standard at the nearby residential uses. This would be considered a significant impact.

Mitigation Measure NOI-1a is provided that would restrict when construction may occur, require the use of noise reduction features on equipment, limit placement of construction staging areas, and require the installation of a 10-foot high temporary sound wall along the southern edge of the project site that covers all of the shared property lines with 87 Sinnott Lane, 121 Sinnott Lane, and 133 Sinnott Lane.

The analysis above found, with implementation of Mitigation Measure NOI-1a, the project will provide noise-suppression techniques to minimize the impact of temporary construction noise and avoid possible violations of local and state standards. In addition, the proposed project will require the installation of noise reduction features (e.g., mufflers and engine shrouds) on construction equipment that are no less effective than those originally installed by the manufacturer. Implementation of Mitigation Measure NOI-1a, construction noise levels at the nearby sensitive receptors would be reduced to meet the OSHA 90 dB standard. Therefore, with implementation of Mitigation Measure NOI-1a, construction nose impacts would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure NOI-1a.

Level of Significance After Mitigation

Less than significant impact.

3.10 - Public Services and Recreation

3.10.1 - Introduction

This section describes the existing public services and recreation setting and potential effects from project implementation on the site and its surrounding area. Descriptions and Analysis in this section are based on information provided by the City of Milpitas General Plan, Municipal Code, Milpitas Parks and Recreation Master Plan, and the Milpitas Trails Master Plan. Public service response letters are provided in Appendix G.

3.10.2 - Environmental Setting

Fire Protection and Emergency Medical Services

The Milpitas Fire Department (Fire Department) provides fire protection and emergency medical services to the City of Milpitas. The Fire Department's service area within the city limits is approximately 13.6 square miles, containing a population of approximately 69,000. The Fire Department is headquartered at Station No. 1, located at 777 S. Main Street in Milpitas.

Stations

The Fire Department operates four fire stations. The nearest station to the project site is Station No. 1, located at 777 S. Main Street. Table 3.10-1 summarizes Station No. 1's characteristics.

Table 3.10-1: Fire Station No. 1 Summary

Address	Approximate Distance from Project Site (miles)	Remarks
777 S. Main Street	.72	Typically staffed with seven personnel; equipped with an engine and truck/rescue company. This staffing includes a supervisory Battalion Chief.
Note: Distances calculated using Google Maps. Sources: Milpitas Fire Department, 2012; Michael Brandman Associates, 2012.		

Organization and Staffing

The Fire Department employs 60 people in two divisions: the Response and Preparedness Division and Fire Prevention Division.

The Response and Preparedness Division is responsible for responding to emergency incidents, safety, training, disaster preparedness, and public information. The Response and Preparedness Division is staffed with 56 positions.

The Fire Prevention Division oversees fire and panic safety plan review, inspection and enforcement for new construction, fire extinguishing and detection systems, annual inspections, hazardous materials regulation, and investigations. The Fire Prevention Division is staffed with four positions.

Apparatus

The Fire Department operates three engines, one engine/quintuple combination pumper, one truck, and one rescue vehicle.

Calls for Service

In 2011, the Fire Department responded to 4,075 calls for service. Based on Fire Department reports for the month of February 2012, Station 1 (the station closest to the project site) responded to 81 incidents with an average response time of 4 minutes, 8 seconds.

Response Times

The emergency response time goal of the Fire Department is to deploy one engine to the scene of an emergency within 5 minutes 90 percent of the time. The Fire Department's average response time to all calls is currently below the 5-minute response time goal.

Mutual Aid

The Fire Department has mutual joint aid agreements with the City of Fremont and San Jose Fire as well as the Spring Valley Volunteer Fire Department through the Santa Clara County Local Mutual Aid Plan. In addition to local joint response, all fire departments in the State are signatory to a master mutual aid agreement. This agreement was established to provide assistance for major incidents.

ISO Rating

The Insurance Service Office (ISO) Grading Schedule is a means of classifying cities with reference to their fire defenses and physical conditions. The insurance classification developed under this schedule is only one of several elements used in development of fire insurance rates. The ISO rating for the Fire Department is Class 3. The ISO rating is on a scale of 1 to 10, where Class 1 is the best rating. In most instances, the fire insurance costs are the same for single-family residential structures in the 2 to 4 rating range. Commercial, industrial, and multiple residential insurance costs can be substantially affected by ISO ratings.

Police Protection

The Milpitas Police Department (Police Department) provides police protection to the City of Milpitas. The Police Department is headquartered at 1275 N. Milpitas Boulevard.

Staffing and Assignments

The Police Department is staffed by 104 employees. Of this figure, 83 positions are sworn law enforcement officers and 21 are non-sworn civilians.

The Field Services Division provides 24-hour patrols of the City of Milpitas. The Field Services Division is organized into three patrol shifts, each of which is supervised by a lieutenant and two sergeants. The City is divided into six geographical beats, and on most shifts and most days, each beat is filled. The Traffic Safety Unit of the Field Services Division is responsible for traffic enforcement and is staffed by a lieutenant, a sergeant, and eight officers.

The Special Operations Division oversees the Investigations Bureau. Ten detectives investigate crimes, with five assigned to general crimes and five assigned to street crimes.

Calls for Service

The Police Department responded to 78,894 calls for service in 2011.

Response Times

In 2011, the Police Department's average response time for emergency calls was 2 minutes, 41 seconds, and average response time for priority calls was 5 minutes, 14 seconds. The Police Department has adopted a standard response time of 4 minutes or less for all emergency calls.

Local Schools

The Milpitas Unified School District (School District) serves the project area and maintains 13 schools, as summarized in Table 3.10-2.

Table 3.10-2: Local School Summary

School	Grades	Enrollment (2010-2011)
Alexander Rose Elementary	K-6	439
Anthony Spangler Elementary	K-6	525
Calaveras Hills	10-12	181
Curtner Elementary	K-6	647
John Sinnott Elementary	K-6	708
Joseph Weller Elementary	K-6	441
Marshall Pomeroy Elementary	K-7	725
Milpitas High	9-12	3,002
Pearl Zanker Elementary	K-6	640
Rancho Milpitas Middle	7-8	724
Robert Randall Elementary	K-6	467
Thomas Russell Middle	7-9	767
William Burnett Elementary	K-6	621
Total	—	9,887
Source: Ed-Data, 2012.		

As of October 2011, the School District had a total enrollment of 9,947 students.

Future Enrollment

The School District forecasts that enrollment will increase by 603 students between 2011 and 2016 (10,550 total), and 1,100 students between 2011 and 2021 (11,047 total).

Milpitas currently levies state-mandated school fees for new residential development at the time of building permit issuance.

Parks, Trails, and Community Facilities

The Milpitas Parks and Recreation Services Department oversees parks, recreation, and community facilities within the City. The Milpitas Park system contains 33 parks, several miles of trails, five community service buildings, a dog park, and a sports complex.

Parks and Open Space

The City of Milpitas has over 33 park locations, totaling 200.84 acres. Parks are generally classified as Regional, Community, Neighborhood, Urban, Linear, Special Use, or School parks. Parks contains an assortment of amenities such as softball fields, tennis courts, basketball courts, handball courts, bocceball courts, volleyball courts, horseshoes, and barbecuing.

Tom Evatt Park, located west of the intersection of Abel Street and Machado Street, and Starlite Park, located at the southwest corner of Rudyard Drive and Abbott Avenue, are nearest to the project site at distances of 0.36 and 0.50 mile, respectively.

The City's Park and Recreation Master Plan outline the visions, goals, and implementation for the development and maintenance of the Milpitas Park system. The City maintains a standard of 3.5 acres with a minimum of 2.0 acres of public park land for every 1,000 residents within the Midtown Specific Plan Area. In addition, developments within the Midtown Specific Plan may receive credit for private open space for up to 1.5 acres per 1,000 residents for private open space provided in accordance with the criteria specified in the Subdivision Regulations.

Trails

The trail system within the City consists of approximately 6 miles of pedestrian and bicycle trails on flood control levees and within the Hetch Hetchy corridor. In addition, 29 miles of trails are proposed by the Milpitas Trails Master Plan. The majority of existing and proposed trails follow the creeks, rail corridors, and utility rights-of-way that traverse the City. The Midtown Specific Plan promotes the development of the proposed trails. Trails are categorized into four groups: Regional Trails, City Trails, Neighborhood Trails, and On-street Connectors.

Community Facilities

The City of Milpitas maintains a Community Center, a Sports Center, a Teen Center, and a Senior Center. Each is described below.

- Community Center – The Milpitas Community Center, located at 457 E. Calaveras Boulevard, is the site for many of the City's recreation classes and activities. Built in 1982, it is a 24,000-square-foot facility that houses recreation and community service programs.

- Sports Center – The Milpitas Sport Center, located at 1325 E. Calaveras Boulevard, provides sports and fitness classes and programs. The Sports Center offers a 33-piece fitness center, four pools, a large gym, two aerobics studios, locker rooms, shower facilities, drop-in basketball, aerobics, water exercise, lap swimming, and a variety of sports programs.
- Teen Center – The Milpitas Teen Center, located at 1325 E. Calaveras Boulevard (adjacent to the Sports Center) provides activities for teens, ages 12 through 17. The facility offers a pool, ping-pong and foosball tables, video games, computers, and various scheduled activities such as trips, dances, band nights, and tournaments.
- Senior Center – The Barbara Lee Senior Center, located at 40 N. Milpitas Boulevard, consists of a community room/auditorium, two game rooms, three classrooms, an art room, an exercise/dance room, and a fitness center.

Library

Santa Clara County Library, a County agency, operates the Milpitas Library located at 160 N. Main Street, approximately 0.15 mile from the project site. The library is open 7 days a week, for a total of 66 hours, and provides programs for children, teens, and adults. The Library Advisory Commission determines library activities and levels of service.

Neither Santa Clara County's General Plan nor the Milpitas General Plan establishes performance standards for the provision of library services.

3.10.3 - Regulatory Framework

State

California Fire Code and California Building Code

The International Fire Code and the International Building Code established by the International Code Council (ICC) and amended by the State of California; prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection.

Leroy F. Greene School Facilities Act of 1998

The California State Legislature enacted the Leroy F. Green School Facilities Act of 1998 (SB 50), which made significant amendments to existing state law governing school fees. SB 50 prohibited state or local agencies from imposing school impact mitigation fees, dedications, or other requirements in excess of those provided in the statute. The legislation also prohibited local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any project.

Local

City of Milpitas General Plan

The General Plan establishes the following principles and policies associated with public services and utilities that are applicable to the proposed project:

- **Principle 2.c-G-1:** Provide adequate school facilities for the City's residents.
- **Policy 2.c-I-1:** Continue working with MUSD, Berryessa Union High School District, and East Side Union School District in its update of the comprehensive facilities plan and to ensure adequate provision of school facilities.
- **Principle 2.d-G-1:** Provide all possible community facilities and utilities of the highest standards commensurate with the present and anticipated needs of Milpitas, as well as any special needs of the region.
- **Principle 4.a-G-1:** Provide a park and recreation system designed to serve the needs of all residents of the community.
- **Principle 4.a-G-2:** Develop a diversified trail system along streamsides and other public rights of way to provide recreational opportunities and link facilities.
- **Policy 4.a-I-1:** Provide 5 acres of neighborhood and community parks for every 1,000 residents outside of the Midtown Specific Plan Area, and 3.5 acres of special use parks for every 1,000 residents within the Midtown Specific Plan Area.
- **Policy 4.a-I-2:** For areas outside the Midtown Specific Plan Area, require land dedication or in lieu fees equivalent to the 5 acre/1,000 resident standard, but allow credit for private open space for up to 2 acres/1,000 residents for private open space provided in accordance with the criteria specified in the Subdivision Regulations. For areas within Midtown, require land dedication or in lieu fees equivalent to the 3.5 acre/1,000 resident standard, but allow credit for private open space for up to 1.5 acres/1,000 residents for private open space provided in accordance with the criteria specified in the Subdivision Regulations.
- **Policy 4.a-I-10:** Implement the goals and objectives of the Park and Recreation Master Plan.
- **Principle 4.a-I-10:** Provide high quality, effective and efficient fire protection services for the Milpitas area residents.
- **Policy 5.c-I-1:** Maintain a response time of four minutes or less for all urban service areas.
- **Policy 5.c-I-1:** Maintain a response time of four minutes or less for all urban service areas.
- **Principle 5.d-G-1:** Use the City's Emergency Management Plan as the guide for emergency management in the Planning Area.

City of Milpitas Municipal Code

Section XI-1-9 of the Milpitas Municipal Code specifies that the amount of land required to be provided as park land in the adopted Midtown Specific Plan Area shall be 3.5 acres per 1,000 people.

3.10.4 - Methodology

Michael Brandman Associates consulted with public service providers regarding their ability to serve the proposed project. Letters were sent to the Milpitas Fire Department and the Milpitas Police Department. The agency responses are provided in Appendix G.

Additionally, Michael Brandman Associates reviewed relevant city documents, including the General Plan, the Municipal Code, the Milpitas Parks and Recreation Master Plan, and the Milpitas Trails Master Plan.

3.10.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G, Environmental Checklist, to determine whether environmental effects to public services are significant, the following questions are analyzed and evaluated.

> Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) Fire protection?
b) Police protection?
c) Schools?
d) Parks?
e) Other public facilities?

According to the CEQA Guidelines' Appendix G, Environmental Checklist, to determine whether impacts to recreation are significant environmental effects, the following questions are analyzed and evaluated.

f) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

g) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

3.10.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Fire Protection/Emergency Medical Services

Impact PSR-1:	**The proposed project may adversely impact fire and emergency medical services.**

Impact Analysis

The proposed project would redevelop the project site with as many as 220 high-density residences. The Fire Department indicated in a letter dated April 6, 2012 (Appendix G) that the proposed project

would significant increase the evening population at the project site. This increase in population will increase demands for emergency services within the development, especially emergency medical response, which account for 65 to 70 percent of all calls for service. However, the Fire Department did indicate that it would have adequate resources to accommodate the proposed project's increase in calls for service. This includes impacts to response times, staffing, apparatus, or other resources.

In response to the Fire Department's concerns, Citygate Associates, a fire safety consulting firm, was retained to evaluate fire response access, onsite access, and other fire code issues that would pertain to the project's buildings. Each topic is addressed below. Citygate's report is provided in Appendix G.

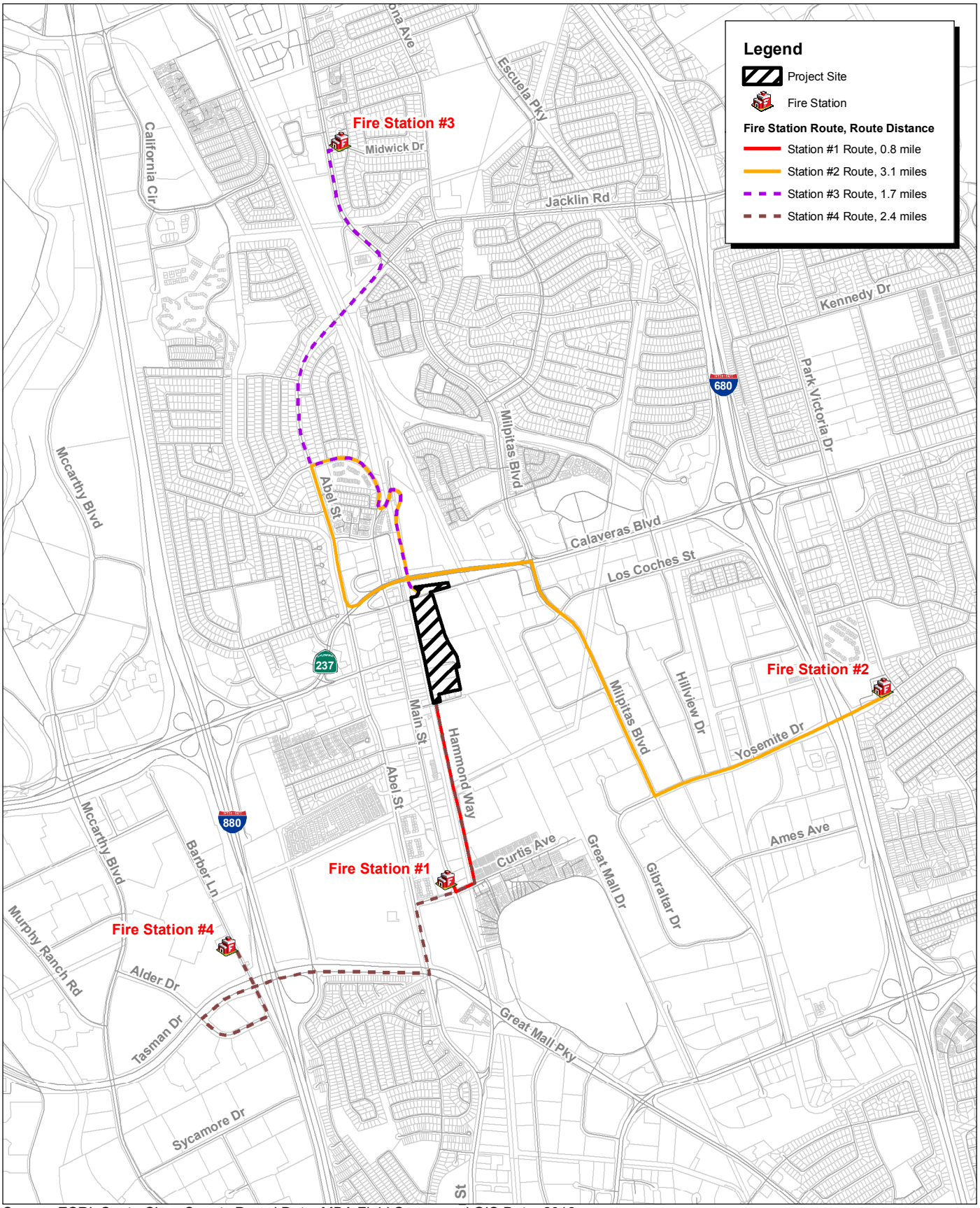
Emergency Response

The site is located between two operational, north-south railroad track sets and is bordered on the north and south by existing commercial properties. The City of Milpitas operates four fire stations inside the City; refer to Exhibit 3.10-1. One station is north of the site, one is southeast, and two are south and southwest. Their street address locations and travel distances[1] to inside the northern or southern third of the project area are:

- Station No. 1 – 777 South Main Street: 0.8 mile to southern project access point
- Station No. 2 – 1263 Yosemite Drive: 3.1 miles to the northern project access point
- Station No. 3 – 45 Midwick Drive: 1.7 miles to the northern project access point
- Station No. 4 – 775 Barber Lane: 2.4 miles to the southern project access point

The fire stations can access the project from the north via Railroad Avenue and from the south via Hammond Way. All fire apparatus must cross over at-grade railroad crossings on the Union Pacific freight line that are just west of the project location. There is no direct public street access to the project through the rail yard on the east side of the project. To access Railroad Avenue or Hammond Way from the east side of the two railroad alignments, apparatus from Stations No. 2 and No. 3 have to use overpasses north or south of the project and then cross back easterly over the Union Pacific track alignment onto Railroad Avenue or Hammond Way.

[1] Close estimates of travel using Google Earth over the actual travel path.



Source: ESRI, Santa Clara County Parcel Data, MBA Field Survey and GIS Data, 2012.

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000 Feet

Exhibit 3.10-1
Emergency Response Routes

Response Time Requirements

The Insurance Service Office (ISO) measures a fire department's ability to stop a conflagration from occurring. It uses multiple factors to assess a department's ability, such as apparatus, staffing, response distance, and municipal water supply, to cite a few. The assessment results in a classification on a 1 to 10 scale, of which Class 1 is the best. Currently Milpitas is rated Class 3.

The ISO classification system requires the first-due engine company in a "built-up" area to be within 1.5 miles driving distance of protected properties. Where required, an aerial ladder apparatus and other needed units should be within 2.5 miles driving distance.

The current Milpitas General Plan for fire department response time policy states in Section 5.c-I-1: "Maintain a response time of four minutes or less for all urban service areas." The start and end times for this measure are not specified, nor is the definition of an urban service area. However, in fire service best practice publications, a time of 4 minutes is commonly referred to as "travel" time, which starts upon leaving the fire station and ends at the arrival of the first unit at the front of the building to be reached.

In the United States, the common practice is that city general plan response time goals are designed to set the physical spacing for all fire stations, not necessarily to guarantee the level of customer service to each and every emergency. In fact, a recommended best practice publication[2] recommends the goal for the deployment system be to deliver a specified response time to 90 percent of the citywide incidents. In Citygate's broad experience in the United States Fire Service, as well as through its review of all available best practice publications on fire service deployment policies, Citygate has never seen a local government response policy designed to guarantee a certain response time to 100 percent of all incidents, nor to specific parcels.

As for the use of the word "maintain" in the current Milpitas General Plan policy for fire service response time, the definition of "maintain" in Section 5.c-I-1 is not defined. Based on the fire service planning principals explained above, the usual and customary use of the word "maintain" would be to keep open or to add stations to deliver the 4-minute travel time to the entire road network in the City, not necessarily to overcome occasional physical obstacles such as traffic, bad weather, at-grade train crossings, or fire units that are busy at other emergencies.

Response Time Calculations

At a constant speed of 35 miles per hour, a fire unit can travel 2.33 miles in 4 minutes. At a constant speed of 25 miles per hour, a fire unit can travel 1.66 miles.

As can be seen from the travel distances listed previously for the Milpitas fire stations, Station No. 1 is within 1.5 miles or well under 4 minutes travel time to the project. Stations No. 3 and No. 4 are

[2] National Fire Protection Association Standard 1710, "Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments." 2010 Ed.; Section 5.2.4.1.1.

within 2.5 miles driving distance, which is also within a best practices recommendation of 8 minutes travel for follow-on units to serious emergencies. Milpitas Fire Station No. 1 houses the Department's ladder truck, so it also is within 2.5 miles of the project in accordance with the ISO classification system.

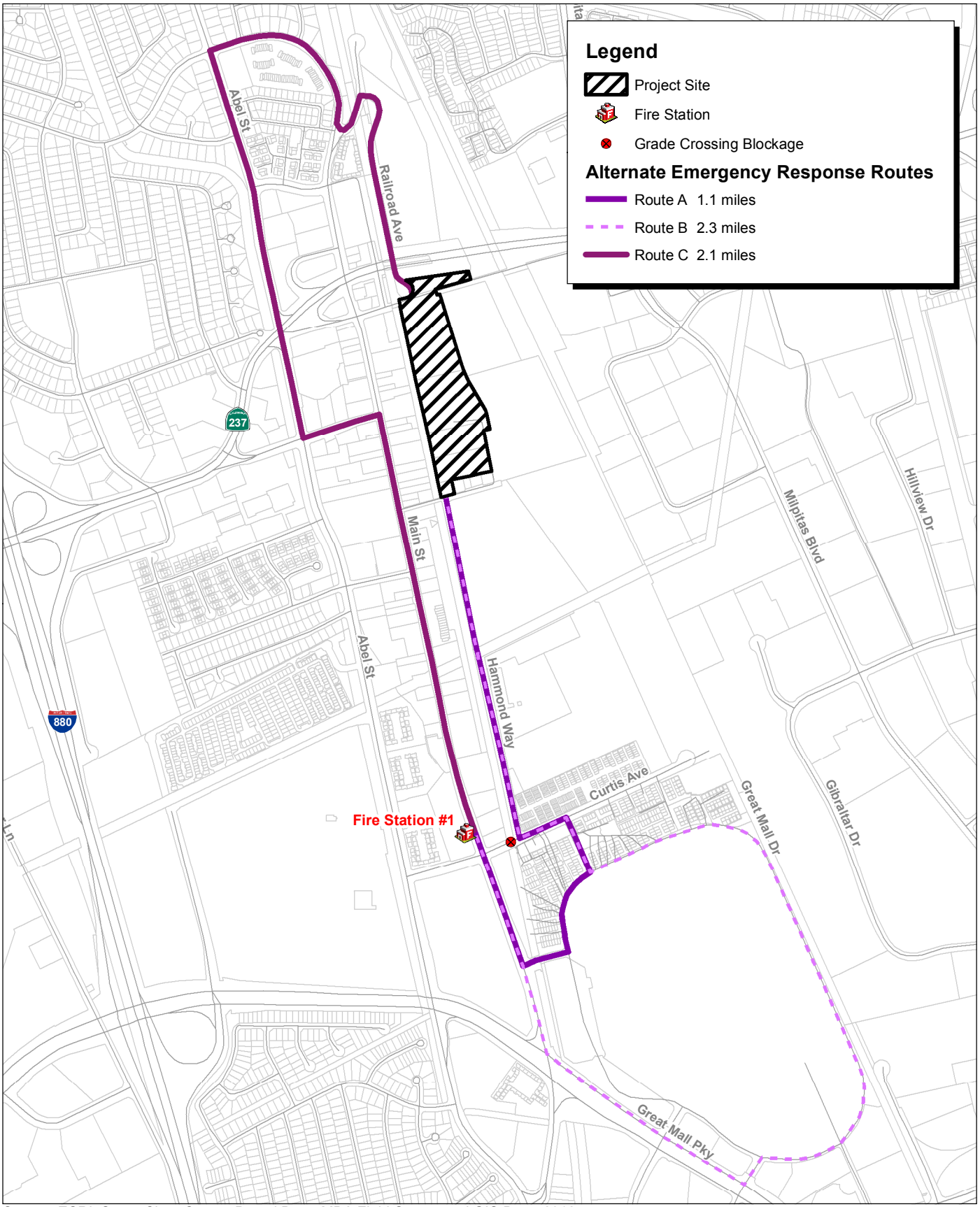
As for the at-grade railroad crossings that the fire apparatus must traverse to get into the project area streets, at-grade crossings are not uncommon in the Bay Area or in many communities in the United States. There are no fire code or other published fire service best practice guides that would limit or stop development because of at-grade crossings potentially interfering with fire or emergency medical responses. Fire Department dispatch centers can communicate with railroads to prevent trains from interfering with emergency response needs.

The other factor to take into account is the frequency of train traffic. In Milpitas, the track on the west side of the project site is a single-track freight line operated by Union Pacific Railroad. According to the Federal Railroad Administration Office of Safety Analysis and verified by a phone call to the Union Pacific Public Affairs Office in Sacramento, the freight line through Milpitas runs up to four freight trains per day, plus some switching movements.

There are three at-grade crossings that can impede fire apparatus travel. Blocking all three at-grade crossings at once on a single-track line means a single train has to be stalled and be 1.27 miles (6,730 feet) long or about 100 to 130 cars, depending on the type of cargo cars used. However, even if a long train blocked all three at-grade crossings near the Preston site, all four fire stations can still reach the Great Mall parking lot and then travel north through the parking lot to West Curtis Avenue without encountering an at-grade train crossing; refer to Exhibit 3.10-2 through Exhibit 3.10-5.

Therefore, while the response routes to the site could be interrupted, there is an alternate path. In addition, as a partial mitigation to response time delays, all of the buildings in the Preston Project will be fully equipped with fire sprinklers pursuant to the adopted Milpitas Fire Code for this type of residential occupancy.

The Emergency Vehicle Access response routes miles and estimated response times for all four fire stations are provided in Table 3.10-3.



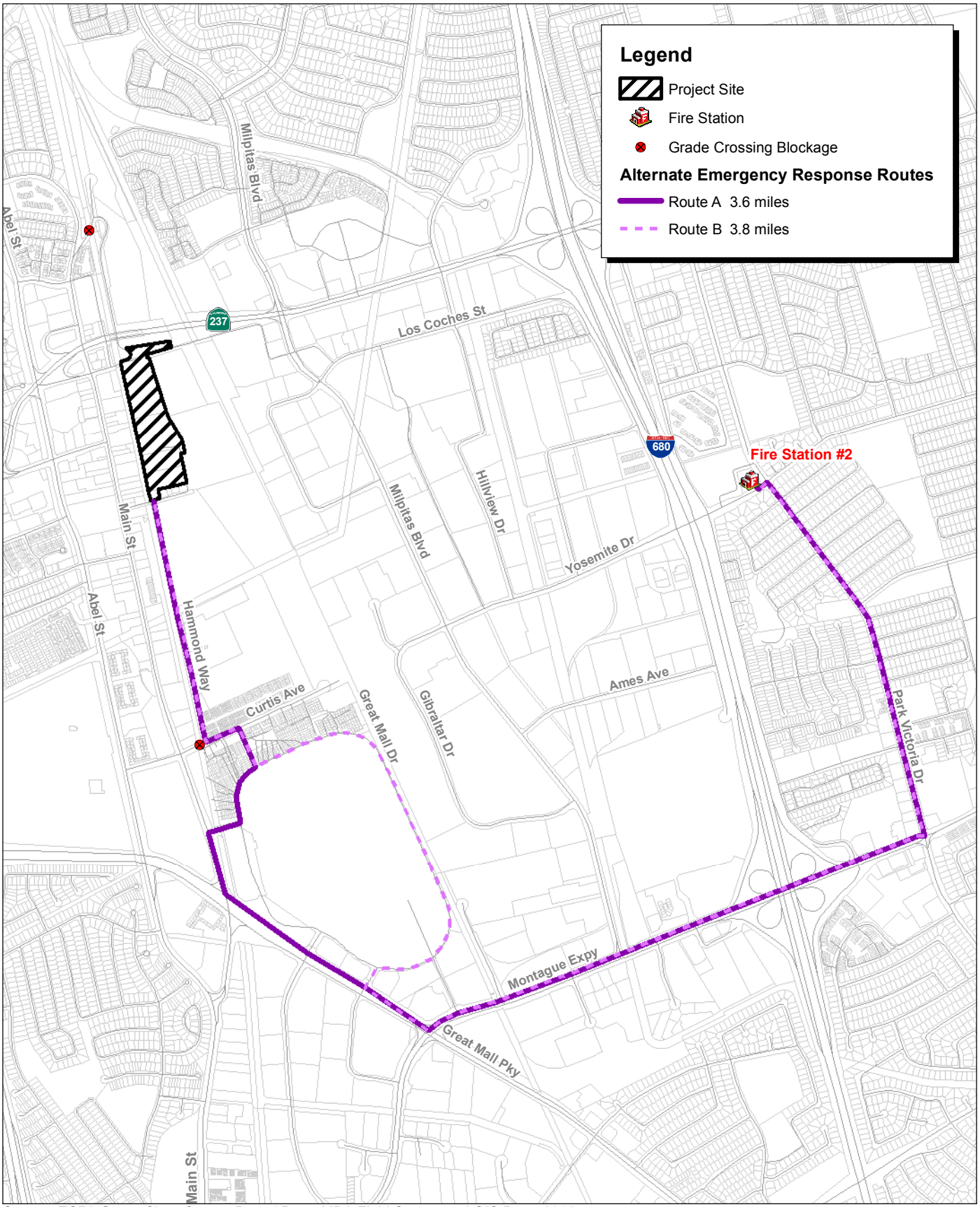
Source: ESRI, Santa Clara County Parcel Data, MBA Field Survey and GIS Data, 2012.

Michael Brandman Associates

NORTH

1,060 530 0 1,060 Feet

Exhibit 3.10-2
Station No. 1 Alternate Emergency Response Routes



Source: ESRI, Santa Clara County Parcel Data, MBA Field Survey and GIS Data, 2012.

Exhibit 3.10-3
Station No. 2 Alternate
Emergency Response Routes

Michael Brandman Associates

NORTH

1,500 750 0 1,500 Feet

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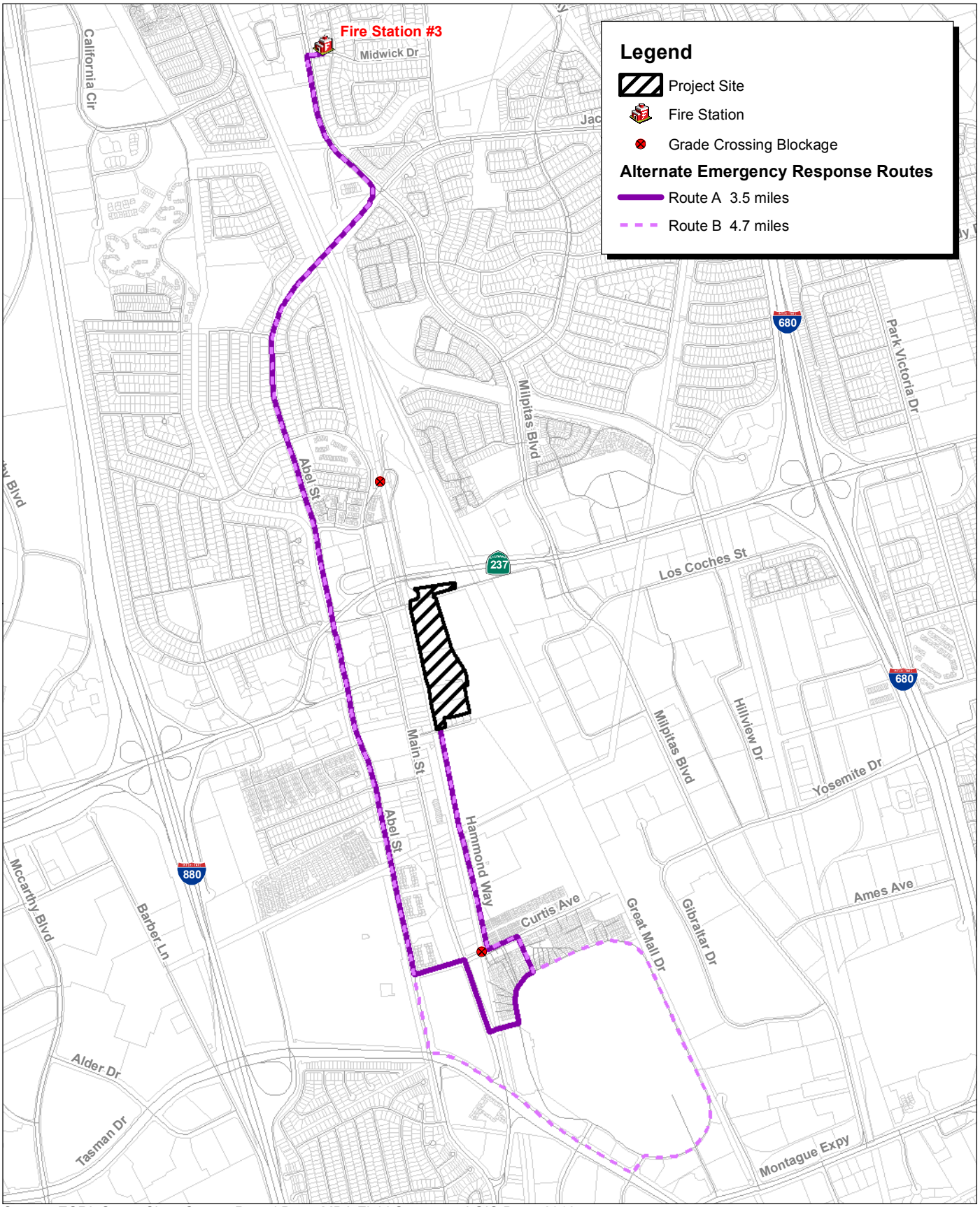


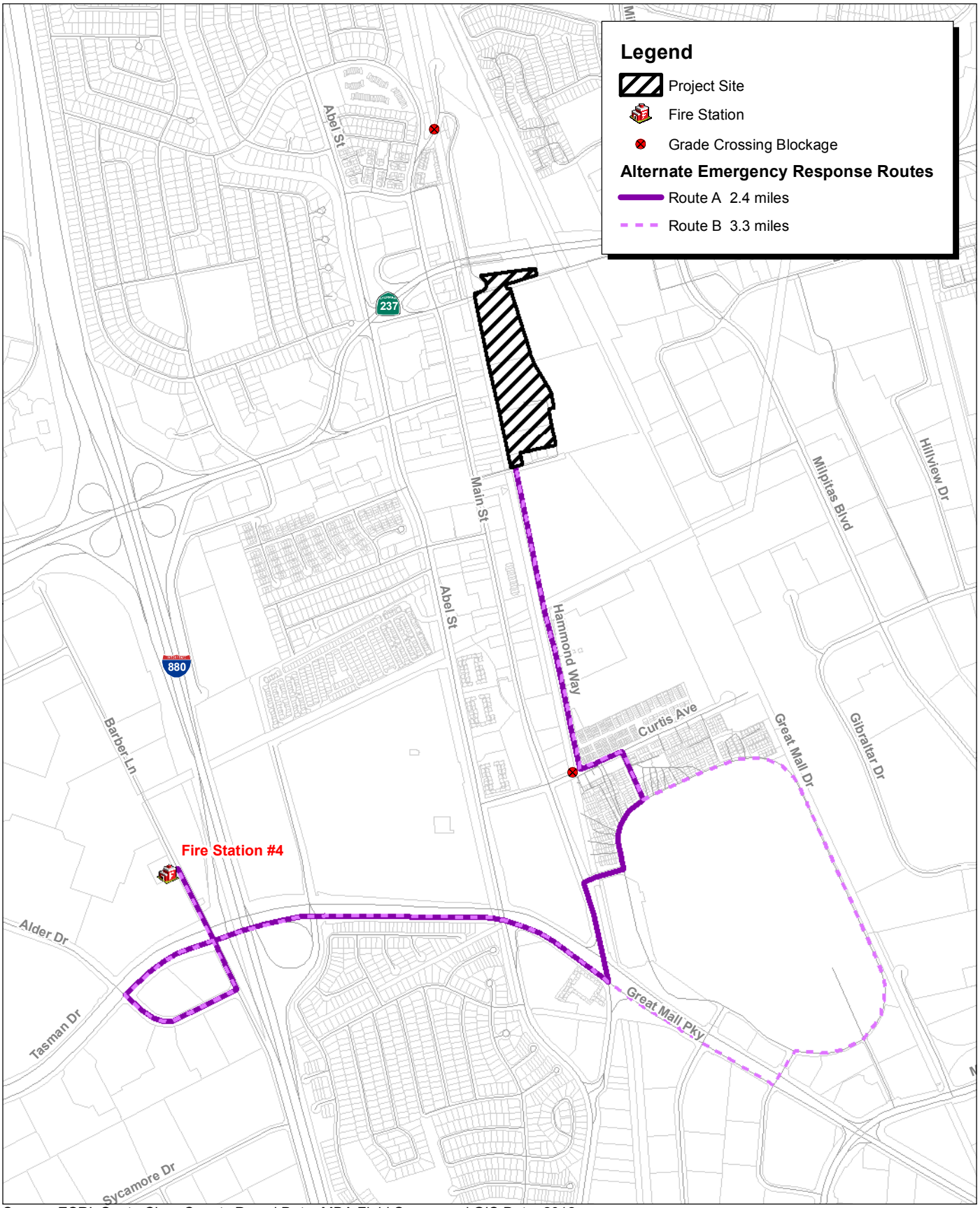
Source: ESRI, Santa Clara County Parcel Data, MBA Field Survey and GIS Data, 2012.

Exhibit 3.10-4
Station No. 3 Alternate
Emergency Response Routes

Michael Brandman Associates

NORTH

1,640 820 0 1,640 Feet



Source: ESRI, Santa Clara County Parcel Data, MBA Field Survey and GIS Data, 2012.

Michael Brandman Associates

NORTH

1,200 600 0 1,200 Feet

Exhibit 3.10-5
Station No. 4 Alternate Emergency Response Routes

Table 3.10-3: Emergency Vehicle Access Response Time Summary

Station No.	Emergency Vehicle Access Route								
	Via West Great Mall Entrance (Main Street)			Via Southern Great Mall Entrance (Montague Expressway)			Via Main Street to Railroad Avenue		
	Miles	Travel Time (minutes:seconds)		Miles	Travel Time (minutes:seconds)		Miles	Travel Time (minutes:seconds)	
		25 mph	35 mph		25 mph	35 mph		25 mph	35 mph
1	1.1	2:37	1:53	2.3	5:29	3:58	2.1	5:00	3:37
2	3.6	8:34	6:13	3.8	9:03	6:33	—	—	—
3	3.5	8:20	6:02	4.7	11:11	8:06	—	—	—
4	2.4	5:46	4:10	3.3	7:52	5:41	—	—	—

Notes:
mph = miles per hour
Emergency Vehicle Access routes shown in Exhibit 3.10-2 through Exhibit 3.10-5.
Source: Citygate Associates, LLC, 2012.

In published fire service deployment best practice recommendations, there are no suggested time requirements for an Emergency Vehicle Access to meet. As an alternate route, it is commonly understood that access is compromised by distance, terrain, or closed gates to be opened. In any event, the response time will be delayed.

As can be seen in Table 3.10-3, Fire Station No. 1 can still access the project if two or even all three at-grade crossings are closed within a 1:53- to 5:29-minute time frame, depending on actual speeds and shortest alternate route available. This is within the best practice recommendations for a travel time of 8 minutes for second-due units on multiple unit emergencies. Thus, using the Great Mall Emergency Vehicle Access, the Station No. 1 time delay impact is less than would occur if Station No. 1 were unavailable and another station had to respond to Hammond Way or West Curtis Avenue, east of the tracks via normal routing. The other stations, while delayed if crossings are blocked, can also access the project in the range of 4:10 to 11:11 travel minutes, depending on route and actual speed.

In any event, use of the Great Mall Emergency Vehicle Access still provides at least two engines and the ladder truck from Stations No. 1 and No. 4 in under 7:52 minutes, in the worst-case scenario, which is less than a normally desirable 8 minutes for First Alarm units. In the worst-case scenario, the fourth-due unit, if needed, would still arrive by the ninth minute.

Therefore, an alternate emergency vehicle route to the project does exist, using mostly public streets, which also means residents in the project could be easily evacuated over the same alternate response routes. The use of Emergency Vehicle Access routing, while it does cause delays, only slows response times to the project area from better than desired to at or slightly past the City's goal point for first-due and multiple-unit responses.

Given the above findings, Citygate Associates does not see a response route or time issue that would prevent the project being considered under the City's adopted Fire Code, General Plan, Development Policies, or other national best practice publications for fire service deployment.

Onsite Fire Access and Protection Analysis

Once fire apparatus reaches the project, the apparatus must be able to maneuver through the site to within 150 feet of the exterior of all the buildings, access fire hydrants and be able to travel through or turn around onsite to leave the project. Citygate conducted a preliminary review of these issues using project plans and the City's adopted Fire and Development Codes and Standards. Given the basic plans available for review at the pre-development phase, some details have not yet been fully decided, and the review below does not replace the City's required plan check process that will determine final requirements.

Fire Department Access into the Site

Two points of access into the site are shown. A third emergency vehicle access is noted adjacent to the Union Pacific Railroad and Ford Creek. It is shown connecting to Sinnott Lane. It appears that, based on property line configurations, a portion of the 24-foot thoroughfare is not within the Preston site. This third access point also crosses other private property. Citygate cannot determine if the City would eventually require a third point of Emergency Vehicle Access, based on the size of the project. City Development Code Section V-300-2.162 specifies that the fire code official can require additional Emergency Vehicle Access connections for projects exceeding 200 units. If there is a third access point required and it has a gate, Emergency Vehicle Access connections shall have an acceptable key box or electronic gate override capability as noted in City Code Section V-300-2.58.

Vertical clearance at and through the site shall be a minimum of 13 feet, 6 inches in accordance with City Codes. Consideration of tree planting locations and streetlights would ensure appropriate vertical clearance for fire apparatus.

Onsite Fire Department Access

Under the City's adopted Fire Code, the fire lane width as proposed is acceptable (except as noted below where fire hydrants are located). If, however, any portions of the building(s) exceed 30 feet in height, the width of fire apparatus access roads will be required to be 26 feet, consistent with City Code Section V-300-2.160.

Based on the proposed width of the internal motor courts and thoroughfares, no parking or standing is permitted to meet the minimum fire lane width of 20 feet. Fire lane designation by curb painting and posting will be required on all thoroughfares and motor courts.

Pursuant to City Code Section V-300-2.56, traffic-calming devices (speed humps, circles, etc.) are prohibited unless specifically approved by the fire code official.

When fire hydrants are provided on access road(s), the minimum access road width is 26 feet as described in City Code Section V-300-2.157. The project plan's proposed roadway width is 22 feet for the motor courts. This potential conflict will have to be reconciled during final design and the City's plan check/permitting process.

It is recommended that the site design civil engineer provide a turning template to City staff using a software program such as "Auto Turn" to show that the motor court turning radius works with the apparatus responding to this site. The Milpitas Fire Department turning requirements are based on radius measurements of 28 feet inside and 48 feet outside. Clearance from streetlights, landscaping, bioswales, etc. will be required.

Based on the site plan, adequate clearance from extended vehicles parked in front of driveways on the motor courts is needed. No driveways are shown for individual residences. No onsite recreational vehicle parking is shown. Minimal off-street parking is shown.

Citygate recommends that a hammerhead turnaround for fire apparatus be provided at building 196 (Street F/Street G radius). This recommendation is reflected in Mitigation Measure PSR-1.

Fire Hydrant Locations and Fire Flow

Onsite fire hydrant locations appear to meet ±300-foot spacing consistent with City development requirements in Section V-300-2.157. Required Motor Court minimum width at hydrants is 26 feet.

The minimum fire flow is ±2,000 gallons per minute at 20-pounds-per-square-inch residual pressure in the water mains. Generally, fire flow is required from two sources of supply or two points of connection. Two points of connection are provided in the current project plan at Hammond Way and Railroad Avenue. The actual fire flows and water main, fire hydrant designs will be finalized during project design and City plan check.

Automatic Fire Sprinkler Protection

Pursuant to City Development Ordinance Section V-300-2.65, all new construction is required to have automatic fire sprinkler protection. All areas within the building—including garages, attics, between floors, bathrooms, etc.—are required to have fire sprinkler protection.

Conclusion

Given these findings, Citygate Associates concludes that the City's Development and Fire Codes can be accommodated during final building design and approval. As such, Citygate concludes the initial project plan is feasible for development.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM PSR-1 Prior to the issuance of building permits, the project applicant shall submit project plans to the City of Milpitas Fire Department for review and approval. The plans shall demonstrate project compliance with all applicable emergency vehicle access and fire safety standards, including provision of minimum required turning radii for fire apparatus. The approved plans shall be incorporated into the proposed project.

Level of Significance After Mitigation

Less than significant impact.

Police Protection

Impact PSR-2: The proposed project would not adversely impact police protection.

Impact Analysis

The proposed project would redevelop the project site with as many as 220 high-density residences. The Police Department indicated in a letter dated March 28, 2012 (Appendix G) that an apartment complex in the City of Milpitas consisting of 101 dwelling units (about half the size of the proposed project) generated approximately 160 calls for service in 2011. As such, the Police Department estimated that the proposed project would generate in the area of 300 to 350 calls for service on an annual basis. The Police Department did not indicate that the proposed project would directly result in a decrease in police protection. However, the following concerns were expressed:

- Overall response times may increase due to the location of a proposed project site. Officers responding from the east side of town are limited to the use of Calaveras Boulevard and Montague Expressway, which can be heavily congested with traffic during commute hours.
- Because of budgetary concerns, staffing levels continue to decrease and may create delayed response times with a rising population and an increase for calls for service.
- The location of the proposed project site is of some concern due to its proximity to the railroad tracks. There is a high potential for vandalism, theft, and other crimes due to the volume of people walking along the railroad tracks.

The Police Department provided the following recommendations for the proposed project:

- Security cameras should be installed in the common areas such as hallways, elevators, and parking garages.
- Parking lots and associated driveways, circulation areas, entrance and exit doors should be provided with lighting of sufficient wattage to provide adequate illumination to make clearly visible the presence of any person on or about the premises during the hours of darkness.
- Onsite security should be present 24 hours a day during construction to prevent any theft or vandalism of construction materials.

Mitigation is proposed that would require the project applicant to incorporate security measures into the proposed project. Note that the Police Department did not indicate that new or expanded facilities would be necessary to serve the proposed project.

With the implementation of this mitigation measure, impacts would be reduced to a level of less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

MM PSR-2a Prior to the issuance of building or grading permits for the proposed project, the applicant shall prepare and submit a description of security measures to be implemented during project construction. The measures shall include but not be limited to the provision of 24-hour onsite security personnel during the duration of construction activities. The provision of 24-hour onsite security personnel may cease once construction is completed.

MM PSR-2b Prior to the issuance of the first certificate of occupancy for the proposed project, the applicant shall prepare and submit a description of security measures that would be implemented at the project site. The Police Department shall review and comment on the proposed measures. The measures may include but are not limited to video surveillance and adequate security lighting.

Level of Significance After Mitigation

Less than significant impact.

Schools

Impact PSR-3:	**Development of the proposed project would not result in a need for new or physically altered school facilities in order to maintain acceptable pupil-teacher ratios or other performance objectives.**

Impact Analysis

The proposed project's 220 dwelling units would directly cause population growth and increase enrollment in the School District. The School District uses a student generation rate of 0.37 student per single family dwelling. Applying this rate the proposed project's 220 dwelling units would yield 82 additional students to the School District's enrollment.

California Government Code 65995 establishes that payment of fees is the "full and complete mitigation" for provision of adequate school facilities and prohibits cities and counties from assessing additional fees or exactions for school impacts. As such, the City and School District can only require that the project applicant pay the established school impact fee at the time building permits

are sought, which is standard requirement for new development. Therefore, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Parks, Trails, and Community Facilities

Impact PSR-4:	**Development of the proposed project may result in a need for new or physically altered parks in order to maintain acceptable park land ratios.**

Impact Analysis

Parks and Community Facilities

Using the City's 2012 average household size of 3.381 persons, the proposed project is projected to add an estimated 744 residents to the City's population. This population increase would be expected to have a corresponding increase in City park facility usage.

As part of the project, the applicant provide open space amenities, including 1.2 acres of land immediately adjacent to Calaveras Boulevard at the north end of the project site for the development of a private park. There is also potential for an area adjacent to the Ford Creek, which may be used for recreation purposes, including a bicycle route to connect Railroad Avenue and Hammond Way.

General Plan Implementing Policy 4.a-I-1 requires the provision of 3.5 acres of special use parks for every 1,000 residents within the Midtown Specific Plan Area. General Plan Implementing Policy 4.a.I-1 requires land dedication or in-lieu fees equivalent to the 3.5 acre per 1,000 residents standard, but it allows credit for private open space, up to 1.5 acres per 1,000 residents. Private open space eligible for credit must be provided in accordance with the criteria specified in the Subdivision Regulations.

Consistent with General Plan policies, Section XI-1-9 of the Milpitas Municipal Code requires that the amount of land required to be provided as park land in the adopted Midtown Specific Plan Area shall be 3.5 acres per 1,000 people. Furthermore, in the Midtown Specific Plan Area, at least 2.0 of every 3.5 acres shall be provided as public park land. If the full area of required park land cannot be provided onsite, the payment of in-lieu fees is required. As such, Mitigation Measure PSR-4a is proposed requiring the project applicant to coordinate with the City to determine the amount of park land and/or in-lieu fees required to be provided pursuant to Municipal Code Section XI-1-9. Implementation of the mitigation would ensure impacts to park lands would be less than significant.

Trails

There are no existing or planned trails within the project site. Proposed City Trails are located west of the project site along Abel Street, and east of the project site along the Union Pacific Railroad right of way. The proposed project includes the potential for an area adjacent to Ford Creek to be used for recreation purposes, including a bicycle route to connect Railroad Avenue and Hammond Way. This would be a publicly accessible route and would be beneficial to the overall trail system located within the City of Milpitas. This is reflected in Mitigation Measure PSR-4b.

Community Facilities

The City of Milpitas maintains a Community Center, a Sports Center, a Teen Center, and a Senior Center. The California Department of Finance estimated the City of Milpitas's population to be 66,696 and estimated the average household size to be 3.381 as of January 1, 2012. Multiplying 220 dwelling units by 3.381 persons per household factors to 744 new residents. This amount of population growth equates to an increase of 1.1 percent relative to the 2012 population estimate.., which is considered a negligible amount of population growth. As such, impacts to community facilities would not be expected.

In summary, the proposed project would provide 1.2 acres of open space to be developed as a private park and, with the implementation mitigation, would pay fair-share fees for the remaining required park land in accordance with Section XI-1-9.05 of the Municipal Code. In addition, the proposed project may develop a bicycle route adjacent to Ford Creek. As such, the proposed project would provide for the development of park lands and maintain acceptable park land ratios. Impacts would be less than significant with the implementation of mitigation.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM PSR-4a Prior to the issuance of building permits, the project applicant shall coordinate with the City of Milpitas to determine the amount of park land and/or in-lieu fees required to be provided pursuant to Municipal Code Section XI-1-9. Park land shall be incorporated into the proposed project and the in-lieu fees shall be paid prior to the issuance of building permits.

MM PSR-4b Prior to recordation of the final map, the project applicant shall depict a trail along Ford Creek (but outside of the waterway banks) and dedicate this land to the City of Milpitas.

Level of Significance After Mitigation

Less than significant impact.

Library Facilities

Impact PSR-5:	**Development of the proposed project would not result in a need for new or physically altered library facilities.**

Impact Analysis

The Milpitas Library provides library services to the City of Milpitas. The City does not maintain standards regarding the level of library services to be maintained for each city resident. The California Department of Finance estimated the City of Milpitas's population to be 66,696 and estimated the average household size to be 3.381 as of January 1, 2012. Multiplying 220 dwelling units by 3.381 persons per household factors to 744 new residents. This amount of population growth equates to an increase of 1.1 percent relative to the 2012 population estimate, which is considered a negligible amount of population growth. As such, impacts to library services would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.