

4.6 NOISE

4.6.1 ENVIRONMENTAL SETTING

EXISTING NOISE ENVIRONMENT

The existing noise environment at the Mission College campus is typical of urbanized commercial/light industrial areas in the South Bay, with the primary sources of noise being vehicular traffic on the Bayshore Freeway (U.S. Highway 101 or US 101), Great America Parkway, and other arterials in the area. The campus is also located between two airports (3.1 miles southeast of Moffett Field and 2.4 miles northwest of San Jose International Airport) and frequent overflying aircraft can be heard on campus. Campus buildings are located as close as 900 feet from the Bayshore Freeway to the south, while most buildings located more than this distance from the freeway. The intervening distance and commercial and office development (The Mercado Center and Yahoo) both help to attenuate traffic noise from the freeway and Great America Parkway at the campus.

Existing Noise Levels. In order to characterize the existing noise environment at the site, noise levels were measured at several locations on the Mission College campus (Figure 4.1-1 in Section 4.1, Land Use). Measurements indicate that noise levels vary substantially on the campus (between 50 and 65 dBA, Leq¹) depending on location. Daytime noise levels in the vicinity of the Mission College Boulevard Loop Road generally range between 60 and 65 dBA (Leq), while daytime noise levels are substantially lower (50 dBA, Leq) in campus areas away from parking lots and roadways. Long-term (24-hour) measurements indicate that noise levels near the campus perimeter (along the Mission College Boulevard Loop Road and in campus parking lots) range between 65 and 67 dBA (CNEL²).

According to the Santa Clara General Plan Noise Element, noise generated by aircraft using the San Jose International Airport significantly affects Santa Clara residents located north of the Bayshore Freeway. The City of Santa Clara uses the official Santa Clara County Airport Land Use Commission (ALUC) Referral Boundary (65 dBA, CNEL) Map as a basis for referring proposed projects to the Airport Land Use Commission. Mission College is located outside this boundary.

¹ The decibel (dB) scale is used to quantify sound intensity. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting" written as "dBA." The continuous equivalent-energy level is that level of a steady noise having the same sound energy as a given time-varying noise. The Leq represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is the descriptor used to calculate the Ldn or CNEL.

² CNEL is a 24-hour, time-weighted noise level that adds a 5-dB penalty during the evening hours (7 p.m. to 10 p.m.) and a 10-dB penalty during the night hours (10 p.m. to 7 a.m.) to account for increased sensitivity to nighttime noise in most communities.

Sensitive Receptors. Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, physiological and psychological stress, and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. Section 5.8.4 of the Santa Clara Noise Element defines residential sites as well as educational and medical facilities to be noise-sensitive areas and the Mission Community College campus is one of four primary noise-sensitive areas identified. In addition, there are residences located to the west across Calabazas Creek, approximately 170 feet from the Mission College Boulevard Loop Road.

4.6.2 CONFORMANCE WITH LOCAL PLANS AND POLICIES

The complex legal principles regarding the extent to which Mission College may be exempt from complying with the City's land use plans, policies, or ordinances are discussed at length in Chapter 4.1. In addition, construction of public school buildings is exempt from the Santa Clara Municipal Code's restrictions related to noise. However, it is the West Valley–Mission Community College District's policy to try to conform to local plans and ordinances whenever possible.

The Noise Element includes a Noise and Land Use Compatibility chart, which is used as a guide for new construction. It is noted that since many areas of the city currently exceed these levels (particularly residential and educational uses), the chart must be considered to be a goal or objective rather than a standard. This chart indicates that noise levels of up to 55 dBA (CNEL) are considered compatible with educational uses. In areas with noise levels between 55 and 70 dBA (CNEL), new educational development is considered conditionally acceptable, whereby noise attenuation measures should be incorporated into the design to reduce noise levels. Noise levels above 70 dBA (CNEL) are considered incompatible.

SANTA CLARA NOISE ORDINANCE

Chapter 9.10 of the Santa Clara Municipal Code is the City's Noise Ordinance and is intended to protect Santa Clara citizens from disturbing, excessive, or offensive noise caused by operation of any fixed noise source. Section 9.10.040 specifies that any noise from operation of any fixed noise source shall not exceed the following noise levels on any other property:

Receiving Zone Zoning Category	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Category 1 – Single-family and Duplex Residential (R1, R2)	55 dBA	50 dBA
Category 2 – Multi-family Residential, Public Space (R3, B)	55 dBA	50 dBA
Category 3 – Commercial, Office (C, O)	65 dBA	60 dBA
Category 4 – Light Industrial (ML, MP)	70 dBA	70 dBA
Category 4 – Heavy Industrial (MH)	75 dBA	75 dBA

Source: City of Santa Clara (2008)

The ordinance restricts construction of any building or related road or walkway, pool or landscape improvement (including construction-related activities such as delivery of construction materials, supplies, or improvements on or to a construction site) within 300 feet of any residentially-zoned property to the following hours: 7:00 AM to 6:00 PM on weekdays and 9:00 AM to 6:00 PM on Saturdays. No construction work is permitted on specified holidays. Section 9.10.240 exempts construction of public school buildings from regulations in Chapter 9.10, since such construction is preempted from local regulation by State law.

4.6.3 POTENTIAL IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based upon the criteria presented in Appendix G of the *CEQA Guidelines*, a project normally would have a significant effect on the environment if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- For a project located within an area covered by 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
- 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

For construction noise, a “substantial” noise increase can be defined as interference with activities during the day and night. For example, one indicator that construction noise could interfere with daytime activities would be speech interference. The above criteria are reflected in the following thresholds to define the significance of potential noise impacts:

- *Compliance with Noise Ordinance Standards.* Applicable limits from the Santa Clara Noise Ordinance were used in this analysis to identify “substantial” increases in noise due to project construction, even though the District, by a super-majority vote of the Board of Trustees, could choose not to comply with the Ordinance with respect to the construction of classroom facilities. Section 9.10.230 limits operation of construction equipment to the following hours on privately-owned property: between 7:00 AM and 6:00 PM, Monday through Friday, and between 9:00 AM and 6:00 PM on Saturday. Since Santa Clara designates Mission College in a Public Space zone, the EIR impact analysis applies the Public Space zone exterior noise limits to this project. If construction

occurs within the specified time limits, then temporary construction-related noise levels higher than those normally deemed acceptable would not be considered significant impacts. These time limits recognize the reality that construction is an inherently noisy process that is socially accepted during certain time periods (when most people are awake and many are at work) even though it would not be acceptable during other time periods (e.g., when most people are resting or are at home). If construction occurs outside of the specified time limits, the noise limits outlined below would apply:

Receiving Zone Zoning Category	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Category 1 – Single-family and Duplex Residential (R1, R2)	55 dBA	50 dBA
Category 2 – Multi-family Residential, Public Space (R3, B)	55 dBA	50 dBA

- *Speech Interference.* Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference criterion, in the context of impact duration and time of day, is used to identify “substantial” increases in noise from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the building exceeds 45 to 60 dBA.³ A typical building can reduce noise levels by 25 dBA with the windows closed (USEPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 70 dBA at receptors would maintain an acceptable interior noise environment of 45 dBA (USEPA, 1974). It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process.
- *Noticeability of Traffic Noise Increases.* An incremental noise increase associated with project-related traffic increases would be significant if it is a noticeable increase. A 10-dBA incremental noise increase is perceived by most people to be a doubling in the loudness of a sound. A 5-dBA increase is readily noticeable, while a 3-dBA increase is barely noticeable to most people. For purposes of the EIR impact assessment, a threshold of more than 3 dBA (barely noticeable) is conservatively considered a significant noise impact.

As indicated in the Initial Study (Appendix A), the project is not covered by an airport land use plan, within two miles of a public use airport, or in the vicinity of a private airstrip. In addition, groundborne vibration would not be an issue and no further discussion of this issue is provided. Project implementation would not require use of pile drivers, which is the construction activity that generates the highest

³ For indoor noise environments, the highest noise level that permits relaxed conversation with 100% intelligibility throughout the room is 45 dBA. Speech interference is considered to become intolerable when normal conversation is precluded at 3 feet, which occurs when background noise levels exceed 60 dBA. For outdoor environments, the highest noise level that permits normal conversation at 3 feet with 95% sentence intelligibility is 66 dBA (USEPA, 1974).

vibration levels. All project-related construction activities would also be set back at least 30 feet from adjacent structures with most set backs well beyond 100 feet. FTA noise and vibration guidelines (2006) indicate that vibration generated by most types of construction equipment (bulldozers, trucks, jackhammers) would range from 0.003 to 0.089 in/sec PPV (inches per second, peak particle velocity) at 25 feet, well below the FTA's recommended construction vibration threshold criteria of 0.2 in/sec PPV for non-engineered timber and masonry buildings structures and 0.12 in/sec PPV for buildings extremely susceptible to vibration damage. Given the project's setback from adjacent and nearby structures, absence of extremely susceptible structures, and proposed construction practices (no pile driving), no further discussion of this issue is required.

CONSTRUCTION NOISE

Impact 4.6-1: Project construction would result in temporary short-term noise increases due to the operation of heavy equipment. (Temporarily Significant)

Development of the proposed project would result in short-term noise increases due to construction of planned projects. During project construction, temporary noise increases would result from the operation of heavy equipment. Construction noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor. To estimate probable noise impacts, typical equipment and construction techniques are assumed.

Construction noise sources range from about 76 to 85 dBA (Leq) at 50 feet for most types of construction equipment, and levels of about 86 to 88 dBA for certain types of earthmoving equipment (scrapers, pavers) and impact equipment (jack hammers). Although the highest construction-related noise levels are typically generated by rock drills and pile drivers (which can generate noise peaks of approximately 98 and 101 dBA at 50 feet, respectively), such equipment would not be used for this project, and therefore, noise impacts from these types of equipment are not analyzed. The rate of attenuation is about 6 dBA for every doubling of distance from a point source. Typical noise levels at 50 and 100 feet from the noise source for several types of construction equipment that could be used for this project and potential noise attenuation with feasible noise controls are shown in **Table 4.6-1**.

Consistency with the Noise Ordinance. The Santa Clara Noise Ordinance restricts any construction activities within 300 feet of any residentially-zoned property to the daytime hours and prohibits construction work on Sundays. Since this is a program-level document, construction hours for specific development projects have not yet specified. Since all building construction projects would be located more than 300 feet from residences to the west, Plan-related building construction would not conflict with ordinance time limits, and therefore, the project's consistency with noise ordinance requirements would be a *less-than-significant impact*. There would be a potential for conflict with these time limits when construction of the planned soccer field (3-E) and athletic fields/surface parking lot (5-C) occurs along the

TABLE 4.6-1
CONSTRUCTION EQUIPMENT NOISE LEVELS AND ABATEMENT POTENTIAL

Equipment	Noise Level (Leq) at 50 Feet in Dba		Noise Level (Leq) at 100 Feet in dBA	
	Without Controls	With Controls	Without Controls	With Controls
<i>Earthmoving</i>				
Front Loaders	79	75	73	69
Backhoes	85	75	79	69
Dozers	80	75	74	69
Tractors	80	75	74	69
Graders	85	75	79	69
Trucks	91	75	85	69
<i>Materials Handling</i>				
Concrete Mixer	85	75	79	69
Concrete Pump	82	75	76	69
Crane	83	75	77	69
Derrick	88	75	82	69
<i>Stationary</i>				
Pumps	76	75	70	69
Generator	78	75	72	69
Compressors	81	75	75	69
<i>Impact</i>				
Jack Hammers	88	75	82	69
Pneumatic Tools	86	80	80	74
<i>Other</i>				
Saws	78	75	72	69
Vibrators	76	75	70	69

[†] Estimated levels obtainable by selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme cost (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures).

Source: USEPA (1971)

western campus boundary, a *potentially significant temporary impact*. Implementation of time restrictions consistent ordinance time limits (Mitigation 4.6-1a) would be adequate to reduce this potential impact to a less-than-significant level. It should also be noted that the ordinance exempts construction of public school buildings from these time limits.

Speech Interference Effects. While project-related construction activities could meet the City's Noise Ordinance time limits, the project's noise impact can also be assessed by evaluating whether affected receptors could conduct normal daytime activities without significant disruption. In order to evaluate such

an impact, the project's estimated construction noise levels have been compared to the Speech Interference Criterion described above. Since implementation of the Master Plan would result in construction activities occurring at different locations on campus over approximately 16 years, the potential for noise impact would vary with the type and location of planned projects. Interior remodeling/maintenance projects (planned in seven existing campus buildings) would involve activities that occur primarily inside the buildings. Noise generated outside these buildings would relate primarily to deliveries and any activities in designated outdoor staging areas, if they are necessary. Maintenance projects would involve interior and exterior work. Such work would be limited in scope (repairing exterior walls or roof systems) and generally would not involve use of heavy construction equipment, thereby minimizing the potential for noise disturbance. Projects involving building demolition and new construction would have the highest potential for noise impact. These projects would be longer in duration and involve operation of heavy equipment, thereby increasing the potential for noise disruption. In addition, these projects would have the potential to disrupt any nearby campus activities.

Demolition, expansion, and new construction projects are located primarily in the central campus area (generally within the Inner Loop Road) as indicated in Figure 3-3. This figure shows that each project would have the potential to affect nearby residential, commercial, and office receptors more than others due to its location. Therefore, receptors were separated by location and the distance between the closest receptor to the south, southeast, east, north, and west and the closest project to each of these receptors was determined.

Estimated construction noise levels at the closest receptor locations are presented in **Table 4.6-2**. These noise levels are considered worst-case and conservatively high since they do not include reductions that would occur from topography or noise barriers such as fencing or intervening buildings.⁴ As indicated in Table 4.6-2, construction noise associated with the following projects (Master Plan projects located in the outer margins of the campus) could exceed the 70-dBA speech interference criterion at the closest residential, commercial, or office receptors, a *potentially significant temporary impact*:

- Project 1-A - Campus Entry / Interim Faculty Parking / I.S. Building / Short-term Parking
- Project 1-B - Hospitality Management Reconstruction
- Project 1-C - Childcare Reconstruction
- Project 3-D - Southwest Parking Lot
- Project 3-E - Soccer Field
- Project 4-A - Opportunity Buildings South

⁴ These levels also generally reflect operation of heavy equipment at full load, and equipment is typically not operated at full load all the time since equipment idles or operates at partial load some of the time.