# 3.6 NOISE

## Introduction

This section describes the existing noise environment and potential impacts associated with the proposed Master Plan for the Medical Center. The description of the noise environment is based on noise measurements taken by EIP Associates. Projected increases in noise levels in the project vicinity can be expected from additional traffic, expansion of various mechanical systems, and construction activities. The incremental change in noise levels experienced by receptors in the project vicinity is evaluated against standards in the City's Noise Element and Noise Ordinance. Potential groundborne noise and vibration during construction activities, as well as during operations, are also considered in this section.

According to the Initial Study (Appendix B), the proposed project is not located within an adopted airport land use plan nor is it located within the vicinity of a private airstrip. As a result, there would no significant airport noise impacts and this topic will not be addressed further in this EIR.

## Setting

### Fundamentals of Noise

**Definition of Noise.** Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The decibel scale adjusted for A-weighting (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Over the audible range of pitch, the human ear is less sensitive to low frequencies and is more sensitive to mid-level and high-pitched sound. Table 3.6-1 lists dBA noise levels for common events in the environment and industry.

The ambient noise environment in an area consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway.

**Measurement Scales for Describing Noise.** Several rating scales have been developed to analyze the adverse effect of community noise on people. To account for the varying nature of environmental noise, these scales recognize that the potential effect of noise upon people depends on the total acoustical energy and the time of day when the noise occurs.

**Table 3.6-1**
**Typical Sound Levels Measured in the Environment and Industry**

| Noise Source (Distance) | A-Weighted Sound Level in Decibels (dBA) | Subjective Impression |
|---|---|---|
| Civil Defense Siren (100') | 130 | Pain Threshold |
| Jet Takeoff (200') | 120 | |
| Rock Music Concert (50') | 110 | |
| Pile Driver (50') | 100 | Very Loud |
| Ambulance Siren (100') | 90 | |
| Diesel Locomotive (25’) | 85 | Loud |
| Pneumatic Drill (50') | 80 | |
| Freeway (100') | 70 | Moderately Loud |
| Vacuum Cleaner (10') | 60 | |
| Light Traffic (100') | 50 | |
| Large Transformer (200') | 40 | Quiet |
| Soft Whisper (5') | 30-0 | Threshold of Hearing |

*Source:* Peterson & Gross, 1963.

Common measures along these scales are as follows:

- $L_{eq}$, the equivalent energy noise level, is the average acoustic energy content of noise, usually measured over one hour. Thus, the $L_{eq}$ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. $L_{eq}$ values do not include a penalty for noise that might occur at night.

- $L_{dn}$, the day-night average noise level, is a 24-hour average $L_{eq}$ with a 10 dBA “penalty” added to noise during the hours of 10:00 pm to 7:00 am to account for the greater nocturnal noise sensitivity of people.

- CNEL, Community Noise Exposure Level, is a 24-hour average with a 5 dBA penalty added to noise during the evening from 7:00 pm to 10:00 pm and a 10 dBA penalty added during the nighttime from 10:00 pm to 7:00 am The CNEL is very similar to the $L_{dn}$, with the CNEL about 0.2 to 1 decibel greater than the $L_{dn}$.

Other noise measures give information on the range of instantaneous noise levels experienced over time. Examples include:

- $L_{max}$ is the maximum instantaneous noise level experienced during a given period of time.

- $L_n$ values indicate noise levels that were exceeded “n” percent of the time. For instance, $L_{25}$ is the noise level that was exceeded 25 percent of the time during a measurement period (e.g., 15 minutes in an hour measurement period).

- SEL is the Single Event Level of noise and is the most relevant noise measurement for nighttime land uses since a high SEL decibel level will interfere with sleep.

Community noise environments are typically represented by noise levels measured throughout the day and night, or over a 24-hour period (i.e., by $L_{dn}$); the one-hour period is especially useful for characterizing noise caused by short-term events, such as operation of construction equipment or concert noise (i.e., with $L_{eq}$). Community noise levels are generally perceived as quiet when the $L_{dn}$ is below 45 dBA, moderate in the 45 to 60 dBA range, and loud above 60 dBA. Very noisy urban residential areas are usually around 70 dBA $L_{dn}$. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA $L_{dn}$. Noise levels above 45 dBA at night can disrupt sleep, and levels greater than 85 dBA can cause temporary or permanent hearing loss. In general, a difference of 3 dBA is a minimally perceptible change, while a 5 dBA difference is the typical threshold that would cause a change in community reaction. An increase of 10 dBA would be perceived by people as a doubling of loudness.[1]

**Noise Attenuation and Abatement.** Noise levels diminish as distance from the source to the receptor increases. Other factors such as the weather and reflecting or shielding intensify or reduce noise levels at any given location. A commonly used rule of thumb for traffic is that for every doubling of distance from the road, the noise level is reduced by about 3 dBA. When the distance from a stationary noise source to a receptor doubles, the noise level is reduced by 6 dBA. A doubling of traffic on any given roadway would cause a noise increase of approximately 3 dBA. Noise levels may also be reduced by interrupting the "pathway" between the source and receptor. For example, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA. Generally, the most effective way to reduce noise in a development is through site planning techniques that place noise-sensitive uses or areas in less noisy area; that provides a physical separation, or buffer, between the source and receptor; and that orient buildings so that noise does not "bounce" between walls. Where this is not enough noise protection, barriers such as sound walls are often used. Sound walls that are placed improperly can in fact have a detrimental effect on noise levels. Where sound walls are used, they perform best if placed at the source of the noise rather than at the noise receptor.

## Existing Noise Environment

The neighborhoods immediately adjacent to the Medical Center include a mix of light industrial, residential, and commercial uses. Several multi-story apartment buildings and a convalescent home are located to the east of the existing Medical Center campus. Noise levels along Veterans Boulevard, which runs east – west along the northern boundary of the Medical Center campus, would be characterized as typical of a major arterial with urban traffic noise sources. The surrounding neighborhoods that are not located directly adjacent to a major street have a lower ambient noise level, typical of urban neighborhoods with the major noise sources being traffic on local streets and neighborhood activity. The noise generated by the Medical Center is all but inaudible at the distant portions of the neighborhoods farthest from the Medical Center. Occasionally, however, ambulance noise can be heard and heating and cooling equipment on the roof at the Medical Center may be audible. Generally, this occurs when a new piece of equipment that has not been properly installed or there is a mechanical problem, such as a bad bearing on an existing piece of equipment. Closer to the

1 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, DOT-T-95-16, April 1995.

Medical Center, activity associated with the Medical Center is more noticeable. Noise levels in these areas are described below.

According to the *San Carlos Airport Master Plan Update Airport Modernization Project Draft Environmental Impact Report*, dated June 2002, the Medical Center is not affected by the updated noise contours for San Carlos Airport.[2] However, arriving aircraft are frequently aligned for an approach for landing over the Medical Center.

## Existing Noise Levels

Existing on-site noise levels were monitored by EIP Associates[3] (see Figure 3.6-1 for measurement locations). Existing daytime noise levels on the site measured along Veterans Boulevard, approximately 300 feet east of Maple Street, (see Location 4 Figure 3.6-1) were recorded at 71.1 dBA $L_{eq}$. Noise measurements ranged from 67.2 dBA $L_{eq}$ at Marshall Street and Beech Street (east of the campus) to 73.7 dBA $L_{eq}$ at Main Street and Bradford Street, near the emergency entrance at the existing main hospital building, in the western portion of the campus.

**Mechanical Equipment Noise.** Operation of typical building mechanical equipment at the site may include air conditioning and heating units, trash pick-up, and landscaping maintenance. Typical noise generated from heating ventilation and air conditioning (HVAC) units range from 60 to 75 dBA at 50 feet.

**Emergency Vehicle Noise.** Emergency vehicle sirens are another noise sources associated with hospital activity. According to Kaiser's revised application material,[4] an average of 8-9 ambulances per day visit the main hospital building at the Medical Center. Although ambulance siren noise level is typically about 90 dBA which is considered to be loud, noise generated by emergency vehicles is not considered to be a nuisance considering the urgent and imperative nature of the operations.

**Other Noise Sources.** Loading activities, consisting of small- to medium-sized trucks, generate noise in the range of 60 to 65 dBA at 50 feet during loading activities (i.e., idling, backing, use of hydraulic liftgates, etc.), while larger trucks generate noise in the range of 70 to 75 dBA at 50 feet. Trash compaction and collection typically generate noise ranging from 70 to 75 dBA at 50 feet. Traffic circulation and parking lot noise typically ranges from 60 to 65 dBA at 50 feet.

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2 City/County Association of Governments of San Mateo County (CCAG), *CCAG Airport Land Use Committee (ALUC) Staff Comments on an Initial Study and Environmental Checklist for the Kaiser Permanente Redwood City Medical Center Master Plan*, October 10, 2002.

3 Measurement were taken using a Larson-Davis Laboratories Model 720 precision sound level meter that satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation.

4 Revised Application Material for Kaiser Redwood City Master Plan (electronic files), June 19, 2002.

**Figure 3.6-1 $L_{eq}$ Noise Measurement Location**

## Applicable Plans and Regulations

Noise levels generated by the Medical Center are regulated by the City of Redwood City's Noise Ordinance (Chapter 24 of the Redwood City Municipal Code). The Redwood City Noise Ordinance sets allowable noise limits for different types of receiving land uses. The noise levels allowed by the Noise Ordinance depend primarily on the background noise level in the area. For the multi-family residential developments around the Medical Center, Section 24.30 of the Noise Ordinance establishes that noise levels generated by construction are prohibited between the hours of 8:00 pm to 7:00 am weekdays, or at any time on Saturdays, Sundays or holidays. In addition, Section 24.31 of the Ordinance prohibits noise levels from exceeding 110 dBA for any item of machinery, equipment, or device used during construction in a residential district.

The City/County Association of Governments of San Mateo County strongly urge the City of Redwood City to require Kaiser to, at least, insulate the new hospital to achieve an interior noise level (due to exterior noise sources, including aircraft) of not more than 45 dBA CNEL.[5] This noise insulation standard is mandatory for residential dwellings as presented in Title 24, part 2, of the California Code of Regulations but is not required for institutional buildings.

The Noise Element of the *City of Redwood City Strategic General Plan* contains noise and land use compatibility recommendations for evaluating the compatibility of new uses with the on-site noise environment. Residential noise levels are considered satisfactory with a CNEL of less than 55 dBA. Above a CNEL level of 60 dBA in residential land use area, construction or development should not be undertaken. For commercial land uses, which characterize most of the uses surrounding the Medical Center, ambient noise levels are considered satisfactory if they are less than 70 dBA CNEL, while noise environments between 70 dBA and 80 dBA CNEL are considered conditionally acceptable. Under these conditions, new development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the project design. New construction or development should not be undertaken in noise environments exceeding 80 dBA CNEL containing commercial land uses.

The following policies identified in the City's Noise Element would apply to the proposed project:

**Policy N-2**: Limit the hours of operation at all noise generation sources wherever practicable, unless an emergency exists.

**Policy N-3**: Require all exterior noise sources (construction operations, air compressors, pumps, fans, and leaf blowers) to use available noise suppression devices and techniques to bring exterior noise down to acceptable levels compatible with adjacent land uses.

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5 City/County Association of Governments of San Mateo County (CCAG), *CCAG Airport Land Use Committee (ALUC) Staff Comments on an Initial Study and Environmental Checklist for the Kaiser Permanente Redwood City Medical Center Master Plan*, October 10, 2002

## Impacts and Mitigation Measures

### Significance Criteria

The CEQA Guidelines state that a noise impact would normally be considered to be significant if noise levels generated by the project would conflict with local goals and plans, or if noise level increases would be significant. For the purposes of this EIR, a noise or vibration impact will be considered significant if:

- Noise levels conflict with the goals and policies in the Noise Element of the General Plan;
- Noise levels would violate the limits contained in the Redwood City's Noise Ordinance or construction noise would exceed the noise limits for construction/demolition noise in Redwood City's Noise Ordinance. Section 24.30 of the Ordinance prohibits construction/demolition activities between weekday hours of 8:00 pm and 7:00 am or at any time on weekends or holidays if the noise level generated by any such activity exceeds the local ambient noise level measured at any point within a residential district;
- Noise levels that would exceed the Noise Ordinance limits but would, nonetheless, generate an average noise level that would exceed the existing noise level by 6 dBA or more;
- Traffic-generated noise would increase the CNEL by 3 dBA; or
- Vibration levels would exceed a peak particle velocity (PPV) of 0.5 inch per second at a sensitive receptor, thereby causing potential structural damage (including cosmetic damage like plastic cracks) and annoyance.

### Environmental Analysis

As described in Section 3.1, for each impact, a level of significance is determined and is reported in the impact statement. Conclusions of significance are defined as follows: significant (S), potentially significant (PS), less than significant (LTS), and no impact (NI). If the mitigation measures would not diminish potentially significant or significant effects to a less-than-significant level, the impacts are classified as "significant unavoidable effects (SU)." For this section, NO refers to Noise.

***NO-1. Construction Noise and Vibration*** *- Under the proposed project and the Higher Occupancy Scenario, construction of new facilities at the Kaiser Medical Center campus would temporarily generate noise and vibration levels that would exceed the limits set forth in the City of Redwood City's Noise Ordinance for construction and demolition noise. (S)*

Construction of the proposed project would occur in five phases beginning in 2003 and completing in 2025. During this period, a wide variety of construction and demolition equipment would be used and material would be transported to and from the site by truck. Table 3.6-2 shows typical noise levels generated by construction equipment.

**Table 3.6-2**
**Typical Outdoor Construction Equipment Noise Levels**

| Equipment Type | Typical Sound Level at 50 Feet in dBA $L_{eq}$ |
|---|---|
| Pile Driver: | |
| Impact | 101 |
| Vibration | 96 |
| Backhoe | 80 |
| Bulldozer | 85 |
| Compactor | 82 |
| Compressor | 81 |
| Concrete Mixer | 85 |
| Concrete Pump | 82 |
| Crane, Mobile | 83 |
| Loader | 85 |
| Pavement Breaker | 88 |
| Paver | 89 |
| Pump | 76 |
| Roller | 74 |
| Truck | 88 |

*Source:* Harris, Miller, Miller & Hanson, Inc.;
*FTA, Noise and Vibration Technical Report, 1995.*

At a maximum, unattenuated noise levels at the boundary of the project site could exceed 89 dBA during construction. The nearest residence is located approximately 75 feet from the Medical Center campus. Average noise levels would vary by phase depending on the equipment used and the duration of the phase. During demolition phases, it could be expected that jackhammers, front loaders, and trucks would be the major noise sources. After this phase, excavation of the basement part of the building would occur. Bulldozers, front loaders and trucks would, again, be expected to be the major noise sources. During foundation and building construction, concrete mixers, concrete pumps, cranes, generators, pumps, and other power tools are expected to be used on the during these activities. Pile driving is anticipated and necessary during construction of the proposed project. The noise generated during each phase would vary, but it is likely that for extended periods of time during each phase, noise levels may exceed 60 dBA outside the residences within 500 feet of the project site. This would be a potentially significant impact.

Pile driving is potentially the greatest source of noise and vibration generated from construction activities. There are essentially two types of pile drivers: vibratory and impact. A vibratory pile driver, which can operate at different frequencies, vibrates the pile into the ground. The continuous motion of vibratory pile driving may increase the resonance response (sympathetic vibrations in response to ground vibrations) of building structures. The typical noise level at

50 feet from this type of source is 96 dBA. Typical PPV values at 25 feet for vibratory equipment ranges from 0.734 to 0.170.[6]

Impact pile drivers produce a high level of vibration for short periods (0.2 second) with sufficient time between impacts to allow a building's resonant effects to decay before the next vibration event.[7] The typical noise level at 50 feet from this type of source is 101 dBA. Typical PPV values at 25 feet for impact equipment ranges from 1.518 to 0.644.

Since much of the project area is unconsolidated soils, consisting of sand, rock, clay and mud, it is difficult to quantify the vibration impacts of pile-driving activities. However, it is possible that impacts would occur from pile-driving activities next to existing and occupied structures. These impacts would be temporary and dependent on such factors as the location of the piles relative to existing structures, the time and energy required to drive the piles, the type of pile driver and the structural design of the buildings. Any existing structure or sensitive receptor within 50 feet of the pile driving activity would be affected if appropriate mitigation measures were not implemented to reduce these noise and vibration impacts.

MITIGATION MEASURE. The following mitigation measure would reduce most of the potentially significant construction noise impacts. Although implementation of these measures would minimize the effects of construction-related noise and vibration on nearby structures and sensitive receptors, the impact would remain significant and unavoidable. (SU)

*NO-1.1* *Implement Best Management Practices to Reduce Construction Noise.* The proposed project shall incorporate the following practices into the construction documents to be implemented by the project contractor and these practices shall be provided to the Community Development Director for approval prior to the issuance of building permits:

a. Comply with noise and vibration control measures identified in the *Redwood City General Plan* (i.e., Policy N-2 and Policy N-3 described in the Setting section under "Applicable Policies and Regulations").

b. Maximize the physical separation between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures:

- Provide enclosures such as heavy-duty mufflers for stationary equipment and barriers around particularly noisy areas on the site or around the entire site;

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6 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* DOT-T-95-16, April 1995, Table 12-2 – Vibration Source Levels for Construction Equipment.

7 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* DOT-T-95-16, April 1995.

- Use shields, impervious fences, or other physical sound barriers, to inhibit transmission of noise to sensitive receptors;
- Locate stationary equipment to minimize noise impacts on the community; and
- Minimize backing movements of equipment.

c. Use quiet construction equipment whenever possible, particularly air compressors.

d. Impact equipment (e.g., jack hammers and pavement breakers) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. Compressed air exhaust silencers shall be used on other equipment. Other quieter procedures shall be used such as drilling rather than impact equipment whenever feasible.

e. Prohibit unnecessary idling of internal combustion engines.

f. Schedule construction activity that produces higher noise levels during less noise-sensitive hours (normally 8:00 am to 5:00 pm on weekdays). Minimize noise intrusive impacts during the most noise-sensitive hours by planning noisier operations during times of highest ambient noise levels.

g. Select routes for movement of construction-related vehicles and equipment in conjunction with the Redwood City Community Development Services Department so that noise-sensitive areas, including residences, hotels, and outdoor recreation areas, are avoided as much as possible. Include these routes in materials submitted to the Community Development Director for approval prior to the issuance of building permits.

h. Designate a noise disturbance coordinator who will be responsible for responding to complaints about noise during construction. The telephone number of the noise disturbance coordinator shall be conspicuously posted at the construction site and shall be provided to the Community Development Services Director. Copies of the construction schedule shall also be posted at nearby noise-sensitive areas.

*NO-1.2* *Reduce Pile Driving Noise and Vibration Effects on Structures.* Kaiser shall require that its geotechnical engineering contractor conduct a pre-construction assessment of existing subsurface conditions and the structural integrity of nearby buildings subject to pile driving impacts prior to receiving a building permit. If recommended by the geotechnical engineer, for structures or facilities within 50 feet of pile driving, Kaiser shall require ground-borne vibration monitoring of nearby structures. Kaiser shall also require its construction contractor to use noise-reducing pile driving techniques if nearby structures are subject to pile driving noise and vibration. These techniques are pre-drilling pile holes (if feasible, based on soils) to the maximum feasible depth, installing intake and exhaust mufflers on pile driving equipment, vibrating piles into place when feasible, and installing shrouds around the pile driving hammer where feasible.

***NO-2. Mechanical Noise*** *- Under the proposed project and the Higher Occupancy Scenario, mechanical equipment associated with the new buildings may exceed the noise limits in Redwood City's Noise Ordinance. (PS)*

Noise from roof-mounted equipment typically generates noise levels from 60 to 75 dBA at 50 feet. Assuming the noise levels attenuate at 6 dBA per doubling of distance between the noise source and receptors, sound levels of about 69 dBA would be experienced approximately 100 feet from the noise source. Since these noise sources may be closer than 100 feet from the residences, noise exposure for the nearest residents could exceed the 60 dBA maximum level for residences specified in the City's Municipal Code and expose those receptors to potentially significant noise effects.

MITIGATION MEASURE. The following mitigation measure would reduce potential noise impacts related to mechanical equipment to a less-than-significant level. (LTS)

*NO-2.1* *Design Equipment and Their Location to Reduce Noise Levels.* Kaiser shall retain an Acoustical Engineer who will review the mechanical equipment to make sure that the limits of Redwood City's Noise Ordinance are met, prior to issuance of a building permit. In addition, mechanical equipment (i.e., HVAC, etc.) shall be shielded to muffle noise. If shielding alone will not sufficiently reduce noise to acceptable levels, the equipment shall be sited on the rooftops of new buildings so that the equipment is located farthest from sensitive receptors. The following is a list of techniques that may be recommended by the Acoustical Engineer to sufficiently reduce mechanical noise emissions:

a. Purchasing low-level noise-producing equipment.

b. Placing a solid architectural screen about the mechanical equipment and designed per the Acoustical Engineer recommendations for the project.

c. Enclosing the HVAC system within architectural screens and using the housing to help block the noise.

d. Supplying the air handlers of the HVAC system with a noise control package.

e. Using scroll compressors with the air handler instead of reciprocating compressors.

***NO-3. Loading and Trash Compaction Noise*** *- Under the proposed project and the Higher Occupancy Scenario, noise generated by activities at the loading docks and during trash compaction and collections could potentially impact off-site receptors. (PS)*

Noise generated at new loading docks would be about the same as currently exists. As mentioned above, small- to medium-sized trucks generate noise in the range of 60 to 65 dBA at 50 feet during loading activities (i.e., idling, backing, use of hydraulic liftgates, etc.), while larger trucks generate noise in the range of 70 to 75 dBA at 50 feet. In addition, trash compaction and collection typically generates noise ranging from 70 to 75 dBA at 50 feet. Currently, these facilities are located at sufficient distances (approximately 75 feet to the nearest off-site sensitive receptor) and most locations are buffered from any sensitive receptor (i.e., residential land use) by existing the Medical Center buildings. However, the location of future loading docks and trash storage facilities has not been determined and may result in noise levels above 55 dBA at nearby residences, the noise limit considered the acceptable threshold for residential areas.

MITIGATION MEASURE. The following mitigation measure would reduce potential noise impacts related to mechanical equipment to a less-than-significant level. (LTS)

*NO-3.1* *Design Loading Docks and Trash Collection Facilities to Reduce Noise Levels.* When new medical buildings are proposed within 100 feet of any residential land uses, the project sponsor shall, prior to receiving a building permit, implement the following measures to reduce potential noise impacts from loading dock and trash collection operations.

a. Loading docks, trash compaction, and storage facilities and compressors shall be located so that the campus building itself serves as a noise buffer or adequate noise buffers shall be provided. These noise abatement features shall be shown on drawings submitted for the project's building permits.

b. Auxiliary power sources shall be included and used at each loading dock so that there is no needless engine idling of delivery trucks with refrigerator units. These sources shall be shown on drawings submitted for the project's building permits.

***NO-4. Traffic Noise -*** *Under the proposed project and the Higher Occupancy Scenario, increased traffic noise levels due to implementation of the project would not increase ambient noise levels greater than 3 dBA. (LTS)*

New vehicle and employee trips generated by the Medical Center would contribute to existing traffic noise levels along nearby roadways. Table 3.6-3 presents the existing and future traffic noise levels with and without the project along 11 main roadway segments in the project vicinity. Traffic noise levels are based on peak traffic counts provided by Fehr & Peers Associates and used in conjunction with Federal Highway Administration (FHWA) Highway

Noise Prediction Model (FHWA-RD-77-108). Veterans Boulevard between Main Street and Maple Street generate the greatest traffic noise within the project vicinity, ranging from 62.5 to 62.9 dBA in 2002. As shown in Table 3.6-3, the greatest increase in noise between existing traffic noise (2002) and existing plus project traffic noise (2004), when MOB-1 would be completed, is 1.0 dBA along Veterans Boulevard between Maple Street and Walnut Street. Therefore, traffic noise levels with implementation of the project would be below the 3 dBA significance threshold.

**Table 3.6-3**
**Existing and Projected Traffic Noise Levels, CNEL (dBA) at 50 feet**

| Roadway Segment | Existing Traffic Noise (2002) | Existing Plus Project Traffic Noise (2004) | Future Traffic Noise (2020) | Future Plus Project Traffic Noise (2020) | Future Plus Higher Occupancy Scenario Traffic Noise (2020) |
|---|---|---|---|---|---|
| Marshall Street between Walnut Street and Main Street | 56.0 | 56.5 | 56.9 | 57.2 | 57.9 |
| Marshall Street between Walnut Street and Marshall Court | 55.8 | 56.3 | 56.7 | 57.0 | 57.7 |
| Marshall Street between Marshall Court and Maple Street | 58.0 | 58.9 | 60.2 | 60.4 | 60.8 |
| Marshall Street between Maple Street and Chestnut | 58.6 | 58.8 | 59.8 | 59.9 | 60.2 |
| Bradford between Main Street and Jefferson Avenue | 57.6 | 57.8 | 58.9 | 59.0 | 59.2 |
| Bradford between Main Street and Walnut Street | 54.6 | 55.2 | 56.0 | 56.3 | 57.0 |
| Veterans Boulevard between Main Street and Jefferson Avenue | 63.2 | 63.6 | 64.8 | 64.9 | 65.4 |
| Veterans Boulevard between Main Street and Walnut Street | 62.9 | 63.6 | 64.5 | 64.8 | 65.1 |
| Veterans Boulevard between Maple Street and Walnut Street | 62.5 | 63.5 | 64.7 | 64.8 | 65.1 |
| Veterans Boulevard between Hansen Way and Walnut Street | 61.2 | 63.1 | 63.1 | 63.2 | 63.5 |
| Veterans Boulevard between Hansen Way and Chestnut Street | 61.6 | 61.8 | 63.5 | 63.7 | 64.0 |

*Source:* EIP Associates, 2002.

*Notes:* Based on FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.

***NO-5.*** ***Cumulative Traffic Noise*** *- Traffic generated from either the proposed project or the Higher Occupancy Scenario would not have cumulative noise effects. (LTS)*

The traffic generated due to the project would be the major contributor to cumulative noise. Traffic noise from background growth (2004) and foreseeable development projects were added to existing traffic noise to derive "future traffic noise in 2020." The resultant noise level increase between 2004 and 2020 ranges from 0.8 to 1.9 dBA, with the greatest increases in traffic noise levels occurring at Veterans Boulevard between Walnut Street and Chestnut Street and at Marshall Street between Marshall Court and Maple Street.

Cumulative noise conditions with the addition of the Master Plan and the Higher Occupancy Scenario are shown in the far right column of Table 3.6-3. The cumulative contribution of the project is 0.1 to 1.9 dBA. Contribution of the Master Plan or the Higher Occupancy Scenario is considered less than cumulatively considerable because the overall cumulative impact of the Master Plan or the Higher Occupancy Scenario is less than the significance threshold of 3 dBA for traffic noise. Therefore, traffic generated from the Master Plan or the Higher Occupancy Scenario would have no significant cumulative effect.