3.9 NOISE

3.9.1 INTRODUCTION

This section focuses on the potential noise and vibration impacts of the proposed project. Potential noise and vibration impacts considered in this analysis include effects that would be generated by the proposed project on nearby sensitive land uses, as well as the existing noise from adjacent uses and highways that could impact proposed land uses in the Updated 2009 Redevelopment Plan area. This section is based on a noise study prepared for the project by Charles M. Salter Associates, Inc., in December 2008. The noise study is included in **Appendix 3.9** of this document.

3.9.1.1 Noise Characteristics and Descriptors

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. "Noise" is commonly 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 corresponding to the level barely detectable by a young person with good auditory acuity is called a "decibel" (dB). Because sound or noise can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale, similar to the Richter scale 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 "dB(A)." Any further reference to decibels written as "dB" should be understood to be A-weighted.

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 level that is exceeded over some fraction of a given observation period.

Finally, CNEL is an average A-weighted sound level measured over a 24-hour time period. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, California state law requires that, for planning purposes, an artificial dB increment (or penalty) is added to quiet-time noise levels in a 24-hour noise descriptor. A CNEL noise measurement is obtained after adding a "penalty" of 5 dB to sound levels occurring during the evening from 7:00 PM to 10:00 PM, and

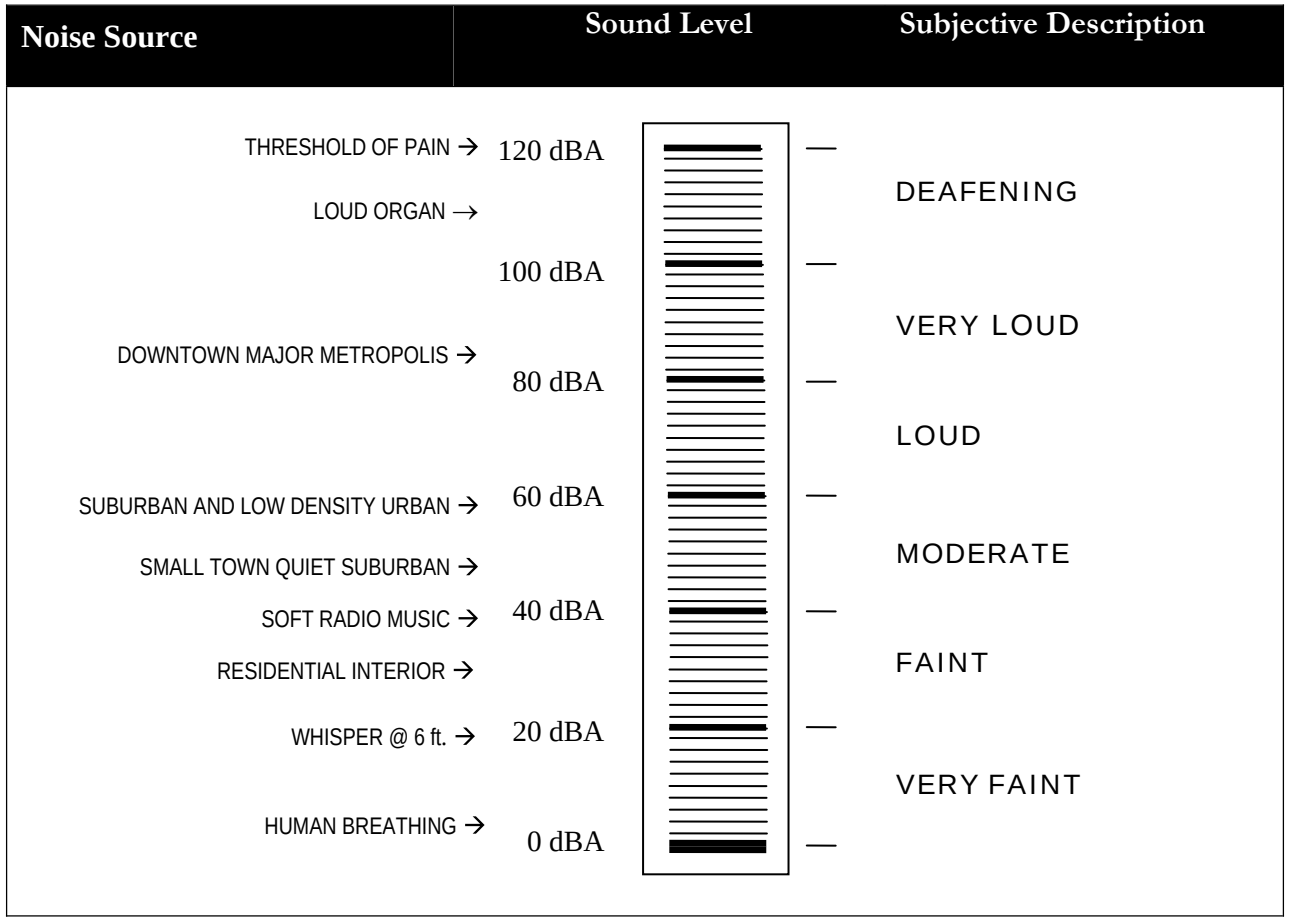
10 dB to sound levels occurring during the nighttime from 10:00 PM to 7:00 AM. As an example of a noise level in the CNEL scale, **Figure 3.9-1, Examples of Sound Levels,** shows examples of sound levels that different activities produce, using A-weighted decibels. All streets with traffic exceeding 10,000 vehicles per day have sufficient traffic to result in noise levels at the property line greater than 65 CNEL. Such levels are normally acceptable for construction of office, commercial, or high-density multi-family residential uses. A level of 65 dB is also the threshold where noise begins to intrude significantly into normal activities such as a conversation. Although some people may express annoyance even if traffic noise levels in usable exterior space (e.g., yards, patios, porches, etc.) are below 65 dB, the percentage of "highly annoyed" people increases dramatically when noise exceeds 65 dB.

3.9.2 ENVIRONMENTAL SETTING

3.9.2.1 Noise Sources

Similar to other cities, transportation-related noise sources including freeways and arterial roadways are major contributors to noise in the City of Hercules. Within the proposed project area, the major transportation noise sources include the Interstate 80, San Pablo Avenue, and BNSF Railroad activity. Other noise sources within the project area consist of typical urban noise sources, with the primary noise source being vehicles on nearby surface streets (Highway 4, Sycamore Avenue). The area also includes various stationary noise sources associated with commercial, institutional, and residential land uses that surround the project area. Temporary sources are also common, such as construction activities, and can affect adjacent uses for extended periods of time.

State and federal agencies have the responsibility to control noise from the source, such as vehicle noise emission levels. A local government has little direct control of transportation noise at the source. Since mobile sources are the City's primary noise contributors, the City's ability to regulate its noise environment is limited to ensuring the compatibility of land uses in the vicinity of the mobile noise source. The City of Hercules has established policies in its general plan regarding land uses that would be considered acceptable near major noise sources. However, in areas where the development of incompatible land uses in noise-impacted areas cannot be avoided, the most effective method available to a city to mitigate and reduce transportation noise impact on the community is through the process of site design review and the construction of noise barriers. The City has established policies that would reduce noise from the construction of new development, reduce the effects of existing noise levels on new development, and reduce the effects of industrial and large vehicle noise on sensitive receptors (e.g., reducing truck traffic through residential neighborhoods).



SOURCE: Impact Sciences, Inc. - December 2008

FIGURE **3.9-1**

Examples of Sound Levels

As shown in **Table 3.9-1, Land Use Compatibility for Community Noise Environments**, Hercules has established acceptable limits of noise for various land uses throughout the City. These standards are designed to integrate noise considerations into land use planning to prevent noise/land use conflicts. These standards serve as the basis for the City of Hercules' policies related to land uses and acceptable noise levels.

3.9.2.2 Noise-Sensitive Land Uses

Land uses such as residential, schools, hospitals, places of worship, parks, outdoor restaurants, and lodging are most affected by noise and are referred to as "noise-sensitive" land uses. **Table 3.9-1** shows the City's noise exposure standards for various land use types. These standards are intended to ensure that new development limits the noise exposure of noise-sensitive land uses. Development standards for new uses may require the use of walls, landscaping, and noise insulation to mitigate the impacts of excessive noise levels.

The Sycamore Crossing site and the Hill Town site, hereinafter referred to as "project sites" or "Added Area" are located in proximity to residential uses, which are considered noise-sensitive receptors.

3.9.3 REGULATORY FRAMEWORK

This draft EIR utilizes established noise criteria from the federal and state standards, as well as from the *City of Hercules General Plan* and the City's land use compatibility guidelines to evaluate the potential noise impacts from the buildout of the Added Area.

3.9.3.1 Federal Regulations

The US Environmental Protection Agency (US EPA) offers guidelines for community noise exposure in the publication "Information on the Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." Based on this information, the US EPA and other federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 to 65 dB L_{dn} (day-night average sound level) are acceptable (Day-night average sound level or L_{dn} is a measure of noise exposure that is essentially the same as CNEL). The US EPA notes, however, that these levels are not regulatory goals, but are levels defined by a negotiated scientific consensus without concern for economic and technological feasibility or the needs and desires of any particular community.

3.9.3.2 California Regulations

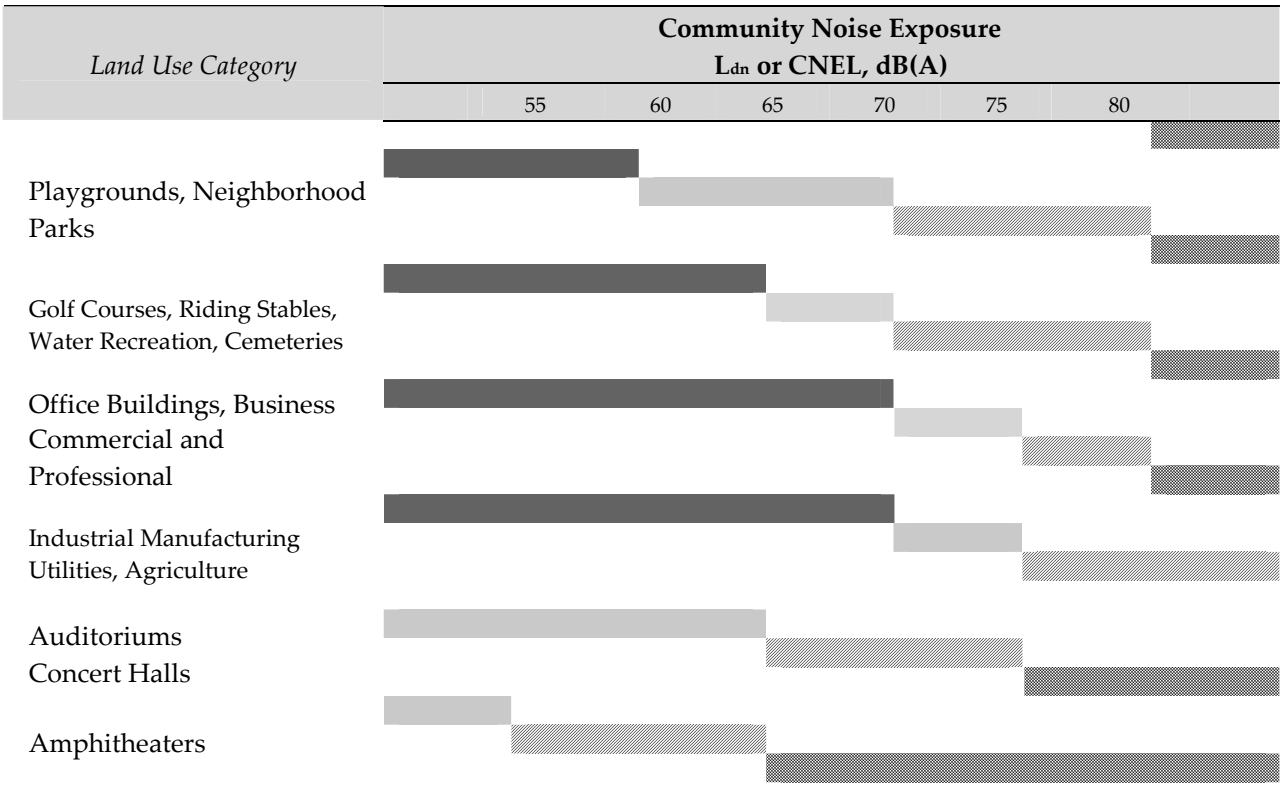
California Government Code Section 63502(g)

The State of California Department of Health Services, Environmental Health Division, has published recommended guidelines for noise and land use compatibility referred to as the *Guidelines for Noise and Land Use Compatibility* (the *State Guidelines*). The *State Guidelines*, illustrated in **Table 3.9-1,** indicate that residential land uses and other noise-sensitive receptors generally should be located in areas where outdoor ambient noise levels do not exceed 65 to 70 dB(A) (CNEL). The Department of Health Services does not mandate application of this compatibility matrix to development projects. However, each jurisdiction is required to consider the *State Guidelines* when developing its general plan noise element and when determining acceptable noise levels within its community.

Under the *State Guidelines*, an exterior noise level of 70 dB(A) L_{dn}/CNEL is typically the dividing line between an acceptable and unacceptable exterior noise environment for all noise-sensitive uses, including schools, libraries, churches, hospitals, day care centers, and nursing homes of conventional construction. This standard also applies to residential uses. Noise levels below 75 dB(A) L_{dn}/CNEL are typically acceptable for office and commercial buildings, while levels up to 80 dB(A) L_{dn}/CNEL are typically acceptable for industrial uses.

Table 3.9-1
Land Use Compatibility for Community Noise Environments

Land Use Category	**Community Noise Exposure L_{dn} or CNEL, dB(A)**					
	55	60	65	70	75	80
Residential – Low Density Single-Family Duplex, Mobile Homes						
Residential – Multi-Family						
Transient Lodging – Motels, Hotels						
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Sports Arena, Outdoor Spectator Sports						



Source: California, State of. Governor's Office of Planning and Research. *State of California General Plan Guidelines.* 2003.

Title 24, California Code of Regulations

California has established noise standards in Title 24 of the *California Code of Regulations*—the State of California Noise Insulation Standards. These standards state that the "interior community noise equivalent level (CNEL) attributable to exterior sources shall not exceed an annual CNEL of 45 dB(A) in any habitable room," and that multi-family residential buildings or structures to be located near an existing or adopted major thoroughfare, railroad, rapid transit line, or industrial noise source within

exterior CNEL contours of 60 dB(A) or greater shall require an acoustical analysis showing that the building has been designed to limit interior noise to a CNEL of 45 dB(A).

3.9.3.3 Local Policies and Ordinances

The *City of Hercules General Plan* Noise Element contains goals relating to new development. These goals are to ensure that all new development is compatible with the existing and future noise environment, and to prevent all new noise sources from increasing the existing noise level above acceptable standards. The City utilizes the state community noise and land use compatibility guidelines, summarized above in **Table 3.9-1**. The level of land use compatibility is based upon the future noise exposure at a proposed land use, with land use types identified as "normally acceptable," "conditionally acceptable," "normally unacceptable," or "clearly unacceptable," depending on the measured CNEL. Except where noise levels fall within the "normally acceptable" range, the City requires that new construction and development occur only after a detailed noise analysis is conducted that identifies noise reduction requirements and corresponding noise insulation features are included in the design of the development.

3.9.4 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines*, the proposed project would have a significant impact with respect to noise if it causes or results in

- exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
- exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- exposure of people residing or working in the project area to excessive noise levels due to the project being 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; or
- exposure of people residing or working in the project area to excessive noise levels due to the project being located within the vicinity of a private airstrip.

An interior CNEL of 45 dB(A) is mandated by the State of California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for multiple-family dwellings and hotel and motel rooms. In 1988, the

State Building Standards Commission expanded that standard to include all habitable rooms in residential use, included single-family dwelling units. Since normal noise attenuation within residential structures with closed windows is about 20 dB, an exterior noise exposure of 65 dB(A) CNEL allows the interior standard to be met without any specialized structural attenuation (dual-paned windows, etc.) features. The noise standards used in this analysis are, therefore, 65 dB(A) CNEL exterior use and 45 dB(A) CNEL interior, which would apply to the all homes, townhouses, condominiums, and hotel within the Updated 2009 Redevelopment Plan Area.

3.9.4.1 Issues Not Discussed Further

There are no public or private airports or airstrips in the project vicinity and the project site is not located within an airport land use plan. Furthermore, there are no public or private airports or airfields within at least 10 miles of the project site. Therefore, the proposed project would not expose people to excessive airport or aircraft related noise levels and these issues are not discussed further in this EIR.

3.9.5 IMPACTS AND MITIGATION MEASURES

3.9.5.1 Project Impacts

Impact Noise-1: **Implementation of the proposed Updated 2009 Redevelopment Plan would add new vehicle trips to the roadway network, but would not increase ambient noise levels in the project vicinity above acceptable levels.** ***(Less than Significant)***

This proposed project would change the land use and zoning designation of existing parcels and expand the redevelopment area to include two new sites. As the two proposed project sites are developed, traffic generated in the area would increase and result in increases in traffic noise along the surrounding streets and highways. Existing and future noise levels for the most congested segments of these roadways were calculated as part of the noise study completed for this project. Four traffic scenarios were evaluated in the noise study. These scenarios are Existing, Existing plus Background, Existing plus Background plus Project, and the estimated Year 2035 Buildout. The noise study used traffic volumes from the traffic study prepared for this project by Charles M. Salter & Associates, which analyzed the traffic that would be generated by the land uses that are planned or projected to be developed on the Sycamore Crossing and Hill Town sites, as well as anticipated development in the surrounding area. **Table 3.9-2, CNEL Levels for Redevelopment Plan Area Roadway Segments,** presents the CNEL along the measured roadway segments, as identified in the noise study prepared for this project (included as **Appendix 3.9**). It should be noted that roadway segments not listed in **Table 3.9-2** are not expected to generate significant noise

levels in the vicinity of the project because these segments are expected to experience smaller increases in traffic.

Table 3.9-2
CNEL Levels for Redevelopment Plan Area Roadway Segments

Roadway Segment	Existing Noise Level CNEL	Existing + Background Noise Level CNEL	Existing + Background + Project Noise Level CNEL	Estimated Year 2035 Build-out Noise Level CNEL
Interstate I-80				
West of Highway 4	87	87	87	88
East of Highway 4	86	86	86	87
San Pablo Avenue				
West of Hercules Avenue	72	73	73	75
Hercules to Tsushima	71	72	72	74
Tsushima to Sycamore	73	74	74	75
Sycamore to Highway 4	73	74	75	76
Highway 4 to Linus Pauling	70	71	72	74
Linus Pauling to Willow	70	71	71	72
John Muir/Highway 4				
West of San Pablo	65	67	67	69
East of San Pablo	80	80	80	82
Sycamore Avenue				
North Front to Tsushima	59	60	61	63
Tsushima to S. Front	60	63	63	64
South Front to San Pablo	63	65	67	68
San Pablo to Willow	68	69	69	69
Willow Road				
East of Sycamore	67	67	68	69

The greatest noise increase caused by project-generated traffic volumes would be approximately 2 dB(A), which would occur along Sycamore Avenue between South Front Avenue and San Pablo Avenue. The project noise contribution would be about 1 dB(A) for San Pablo Avenue between Highway 4 and Linus Pauling Drive, and at Sycamore Avenue between North Front Avenue to South Front Avenue. The project noise contribution would be no more than 0.5 dB(A) for all other roadway segments included in the study area.

In general, a change in noise level of less than 3.0 dB(A) is not typically noticed by the human ear (US Department of Transportation 1980). Changes in noise levels ranging from 3.0 to 5.0 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. A greater than 5.0 dB(A) increase is readily noticeable, while the human ear perceives a 10.0 dB(A) increase in sound level to be a doubling of sound. Since an increase in noise levels from 0.5 dB to 2 dB would not be perceptible, the proposed project would not generate a substantial increase in ambient noise levels. Therefore, the proposed project's impact on ambient noise levels would be less than significant.

Impact Noise-2: **Future development of both the Sycamore Crossing and Hill Town sites may expose residents onsite to noise generated by adjacent roadways and other noise sources, which could exceed the standards established in the State noise compatibility guidelines.** ***(Potentially Significant; Less than Significant with Mitigation)***

The project sites are adjacent to what are considered in the City's *General Plan* to be major and moderate noise sources (I-80, BNSF Railroad, San Pablo Avenue, State Route 4, Willow Avenue and Sycamore Avenue). The proposed project includes changing the *General Plan* and zoning designations of the sites to designations that allow residential uses. As such, future development of the site could expose residents to the noise generated by adjacent roadways. To evaluate the effects of ambient noise levels on the Sycamore Crossing and Hill Town sites, the noise study conducted for the project includes an analysis of the approximate noise contours associated with the major study area roadways for the buildout Year 2035. It should be noted that the noise levels and distances used in the analysis represent the worst-case scenario and do not take into consideration acoustical shielding that would occur as a result of terrain, fencing, or building structures. Furthermore, acoustical shielding would also be provided by new buildings and structures located at the subject development.

Sycamore Crossing Site

Future land uses on this site would be subject to noise generated by San Pablo Avenue, BNSF Railroad, and the more distant I-80. The portion of the site that would experience the highest future noise exposure is located along San Pablo Avenue; it would experience a CNEL of 75 dB(A) at 50 feet from the median centerline in the Year 2035. According to State noise compatibility guidelines, this level of noise exposure would be considered "normally unacceptable" for residential uses[1] (see **Table 3.9-1**). In order to make this portion of the site acceptable for residential uses, a variety of noise attenuation design features would

1 For noise analysis purposes, residential uses include single- and multi-family homes as well as hotels and other lodging.

be required, which are estimated to include[2] (1) 10- to 11-foot sound walls for the common outdoor use areas that are not shielded by buildings to achieve an outdoor CNEL of no more than 65 dB(A); (2) Sound Transmission Class (STC) 35 to 38 windows and exterior doors to achieve no more than CNEL 45 dB(A) indoors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 to 8 fewer points); and (3) residential structures would be required to have an alternative source of ventilation. Additionally, residential uses in this portion of the site would be exposed to night-time railroad operations, which could cause sleep disruption.

Along Sycamore Avenue, the future CNEL would be about 65 dB(A) in year 2035, which the state noise compatibility guidelines considers a "conditionally acceptable" level of noise exposure (see **Table 3.9-1**). At this location, a noise barrier would likely not be needed and windows with STC ratings of about 28 to 32 would likely provide sufficient sound attenuation to reduce noise levels to a normally acceptable level. However, an alternative source of ventilation would likely be required for residences.

In addition to residential uses, land uses being contemplated for the Sycamore Crossing site include various forms of retail and offices. Such uses could be located anywhere on the Sycamore Crossing site without any noise restrictions. As discussed, the portion of the site that is likely to be the most noise-impacted is located along San Pablo Avenue, which would experience a CNEL of up to 76 dB(A) at 50 feet from the median centerline under year 2035 conditions. Although this would not be considered an acceptable noise level for residential uses, the state noise compatibility guidelines consider this level of noise exposure normally acceptable for retail and office uses.

Based on the noise study, land uses on the Sycamore Crossing site could be exposed to noise levels that exceed the standards established in the state noise compatibility guidelines, which would be considered a potentially significant impact.

Hill Town Site

Future land use proposed for this site include multi-family housing. This use would be exposed to traffic noise generated by I-80, Highway 4, and San Pablo Avenue. The portion of the site that would experience the highest future noise exposure from the major roadways is located at the southern end of the site. This area would receive noise from both I-80 and Highway 4, where noise levels at upper floors could be up to 76 dB(A) CNEL in year 2035. The City considers this level of noise exposure "clearly unacceptable" for multi-family uses (see **Table 3.9-1**). In order to reduce exterior noise levels to an acceptable level for

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[2] Exact noise attenuation features cannot be determined until actual site plans and architectural plans are prepared, because such features are dependent on specific design details including distance from noise source and exterior wall finish material selection.

multi-family residential uses (CNEL 65 dB(A)), a sound wall of at least 11 feet in height would likely be required or, in the absence of a sound wall, common outdoor use areas would need to be shielded by at least one or two rows of buildings.

In order to achieve acceptable interior noise levels (45 dB(A) CNEL) in multi-family structures exposed to I-80/Highway 4 noise, the following noise attenuation design features are anticipated to be required:[3] (1) STC 36 to 39 windows and exterior doors to achieve no more than CNEL 45 dB indoors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 to 8 fewer points); and (2) residential structures would be required to have an alternative source of ventilation. It should be noted that, depending on how the site is graded for development, a sound wall along the property line would only be effective for the ground floors of homes located nearest to the wall.

Along San Pablo Avenue, noise levels are expected to be as loud as 73 dB(A) CNEL in the Year 2035, which is still considered "normally unacceptable," by the state noise compatibility guidelines for multi-family uses (see **Table 3.9-1**). In order to reduce noise levels to an acceptable exterior noise level (CNEL 65 dB(A)), a sound wall of 8 to 9 feet in height would likely be needed or, in the absence of a sound wall, common outdoor use areas would need to be shielded by at least one row of buildings. In order to achieve acceptable indoor noise levels (45 dB(A) CNEL) in multi-family structures exposed to noise from San Pablo Avenue, the following noise attenuation design features are anticipated to be required:[4] (1) STC 33 to 36 windows and exterior doors to achieve no more than CNEL 45 dB indoors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 to 8 fewer points); and (2) residential structures would be required to have an alternative source of ventilation.

In addition to residential uses, limited retail uses are being contemplated for the Hill Town site. Such uses would be located in the south-central portion of the Hill Town site.. As discussed, the most roadway noise-impacted portion of the site is the southern end of the site, which would be exposed to noise from both I-80 and Highway 4, where noise levels at upper floors could be as loud as 76 dB(A) CNEL in year 2035. The state noise compatibility guidelines consider this level of noise exposure "normally acceptable" for retail use.

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3 Exact noise attenuation features cannot be determined until actual architectural plans are prepared, because such features are dependent on specific design details including distance from noise source and exterior wall finish material selection.

4 Exact noise attenuation features cannot be determined until actual site plans and architectural plans are prepared, because such features are dependent on specific design details including distance from noise source and exterior wall finish material selection.

Based on all of the above, land uses on the Hill Town site would be exposed to noise levels that exceed the standards established of the state noise compatibility guidelines and impacts would be considered potentially significant.

Mitigation Measures NOI-1 and **NOI-2** require appropriate noise evaluation be conducted at the design level and that noise be attenuated to acceptable levels for the corresponding land uses. With the incorporation of these mitigation measures, the proposed project would not expose future land uses on the Hill Town site or the Sycamore Crossing site to noise levels that exceed the state noise compatibility guidelines. Thus, impacts would be reduced to a less than significant level.

MM NOI-1: The City of Hercules shall not issue a building permit for future projects in the proposed Updated 2009 Redevelopment Plan until a design-level noise study is completed that demonstrates that the proposed development would not cause noise exposures that exceed (1) 65 dB CNEL for common outdoor areas or (2) 45 dB CNEL for indoor residential uses.

Sycamore Crossing: To achieve these required noise levels on the Sycamore Crossing site, residential uses should be located in the northern portion of the site rather than along San Pablo Avenue. The design-level noise study required by this mitigation measure shall consider actual site plans and architectural plans and determine the exact noise attenuation features required to achieve the appropriate noise levels. At this time, the following noise attenuation design features are anticipated to be required for residential uses along Sycamore Avenue: (1) STC 28 to 32 windows and exterior doors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 fewer points); and (2) alternative source of ventilation for residential structures as approved by a mechanical engineer. Should residential uses be considered along San Pablo Avenue on the Sycamore Crossing site, the following noise attenuation design features are anticipated to be required at this time: (1) common outdoor use areas located such that they are shielded from Sycamore and San Pablo Avenues by buildings or, if not shielded by buildings, 10- to 11-foot sound walls for the common outdoor use areas; (2) STC 35 to 38 windows and exterior doors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 fewer points); (3) alternative source of ventilation for residential structures as approved by a mechanical engineer; and (4) notification to all potential homebuyers of night-time railroad operations.

Hill Town: To achieve the required noise levels on the Hill Town site, the design-level noise study required by this mitigation measure shall consider actual site plans and architectural plans and determine the exact noise attenuation features required to achieve the appropriate noise levels. At this time, the following noise attenuation design features are anticipated to be required for multi-family residential uses in the southern portion of the site along I-80/SR-4: (1) STC 36 to 39 windows and exterior doors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 fewer points); (2) alternative source of ventilation for residential structures as approved by a mechanical engineer; and (3) outdoor use areas shielded by at least one or two rows of buildings or by a sound wall of at least 11 feet in height. At this time, the following noise attenuation design features are anticipated to be required for multi-family residential uses along San Pablo Avenue, (1) STC 33 to 36 windows and exterior doors (if sound walls are built, windows and exterior doors at the ground floors could require STC ratings that are about 5 fewer points); (2) alternative source of ventilation for residential structures as approved by a mechanical engineer; and (3) common outdoor use areas shielded by at least one rows of buildings or by a sound wall of at least 8 to 9 feet in height.

MM NOI-2: In accordance with Title 24 of the *California Administrative Code*, the City of Hercules shall not issue a building permit for the proposed project if the interior community noise levels (CNEL) attributable to exterior sources exceed an annual CNEL of 45 dB in any habitable room with windows closed. Pursuant to Title 24, acoustical evaluations of proposed architectural plans will be required to ensure compliance with this requirement.

Impact Noise-3: Future development in the proposed project area has the potential to temporarily increase ambient noise levels during construction of future projects. Additionally, future construction activities could generate ground borne noise or vibrations. (*Significant; Less than Significant with Mitigation*)

Future development in the proposed project area has the potential to temporarily increase ambient noise levels during the construction of future projects. Temporary construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by earth-moving sources, then by foundation and parking area construction, and finally for finish construction**. Table 3.9-3** shows the typical levels of noise generated by various construction equipment. The earth-moving and demolition activities are often the noisiest with equipment noise ranging up to about 90 dB at 50 feet from the source.

Measurements have shown, however, that the noise emission levels in **Table 3.9-3** tend to be more associated with periodic events under full load rather than chronic (hourly or longer) noise exposure. Short-term noise generation thus tends to be on the higher end of the ranges shown in **Table 3.9-3**, while long-term exposure is at the quieter end of the noise spectrum. Noise levels decrease with distance from the noise source. Specifically, spherically radiating point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance, or about 20 dB in 500 feet of propagation. Noise level is also affected by the line of sight from source to receptor and can be reduced by terrain, topography or structures between the site and nearest sensitive receptor.

Table 3.9-3
Typical Construction Noise Levels

Type of Equipment	Range of Sound Levels (dBA at 50 feet)	Suggested Sound Levels for Analysis (dB(A) at 50 feet)
Pile driver (12,000-18,000 ft-lb/blow)	81–96	93
Rock drill	83–99	96
Jack hammer	75–85	82
Pneumatic tools	78–88	85
Pumps	68–80	77
Dozer	85–90	88
Tractor	77–82	80
Concrete mixer	75–88	85
Front-end loader	86–90	88
Hydraulic backhoe	81–90	86
Hydraulic excavator	81–90	86
Grader	79–89	86
Air compressor	76–86	86
Truck	81–87	86

Source: EPA 1971

The *Hercules General Plan* Noise Element contains goals relating to new development. These goals are: ensure that all new development is compatible with the existing and future noise environment; and prevent all new noise sources from increasing the existing noise level above acceptable standards.

All new development in the City of Hercules would be required to comply with the goals and policies contained in the *General Plan*, including the goals listed above. As noted earlier, the project sites are adjacent to what are considered in the City's *General Plan* to be major and moderate noise sources (I-80,

BNSF Railroad, San Pablo Avenue, State Route 4, Willow Avenue and Sycamore). Because the project sites are located adjacent to these noise sources, it is not anticipated that temporary construction noise would exceed acceptable noise levels.

To ensure temporary construction-related noise from future development of the Sycamore Crossing and Hill Town Sites remains at a less than significant level, the policies in the *General Plan* related to construction noise have been included as mitigation. With the incorporation of **Mitigation Measure NOI-3a through NOI-3n**, impacts would be less than significant.

MM NOI-3a The City of Hercules shall ensure that where construction occurs near noise-sensitive areas (as determined by the Community Development Department), construction activities (including truck traffic) be scheduled for periods, according to construction permit to limit the impact on sensitive receptors. This may be done prior to start of construction and may be enforced throughout construction activities on both the Hill Town and Sycamore Crossing sites.

MM NOI-3b Prior to construction, the City of Hercules shall ensure that the applicant develop a construction schedule that minimizes potential cumulative construction noise impacts and accommodates particularly noisy periods for near-by sensitive receptors.

MM NOI-3c The City of Hercules shall ensure that during construction, where feasible, holes for driven piles be predrilled to reduce the level and duration of noise impacts. Where not feasible, pile drive shall be scheduled to avoid conflict with adjacent sensitive receptors.

MM NOI-3d Construction within 500 feet of a sensitive receptor shall require a noise study to identify the estimated level of construction noise. Where construction activities are estimated to exceed an ambient noise level of 70 dB CNEL, the City of Hercules shall ensure that prior to construction, the applicant construct temporary solid noise barriers between source and sensitive receptors to reduce off site propagation of construction noise.

MM NOI-3e Prior to construction, the applicant shall demonstrate, to the satisfaction of the City of Hercules, that internal combustion engines used for construction purposes are equipped with a properly operating muffler of a type recommended by the manufacturer and all power tools are acoustically shielded.

3.9.6 CUMULATIVE IMPACTS

Impact Noise-4: **Traffic generated by the proposed project in conjunction with other past, present and reasonably foreseeable future development would increase ambient noise levels. (*Potentially Significant; Significant and Unavoidable)***

Traffic generated by the proposed project in conjunction with other past, present and reasonably foreseeable future development would increase ambient noise levels. **Impact Noise-1** evaluates the increases in traffic noise levels in the project area for the year 2035. The analysis under that impact concludes that although ambient noise levels will increase as a result of traffic growth, project-related traffic would cause between 0.5 and 2 dB(A) increases in noise levels and that these increases, which would be less than 3 dB(A), would not be perceptible. Therefore the project's impact would be less than significant.

Table 3.9-2 also presents the noise levels that would result from the projected increases in traffic at buildout of the project area in 2035. The table shows that along five roadway segments, the projected increase in noise levels from cumulative traffic would exceed 3 dB(A) and therefore would be perceptible. These roadway segments include: San Pablo between Highway 4 and Linus Pauling (4 dB(A)); John Muir Parkway west of San Pablo (4 dB(A)); Sycamore Avenue between North Front and Tsushima (4 dBA); Sycamore Avenue between Tsushima and South Front (4 dB(A)); and Sycamore Avenue between South Front and San Pablo (5 dB(A)). In addition, noise levels along four of these segments would also exceed the 65 dB(A) noise standard. Cumulative noise impacts along these segments would therefore be significant.

The proposed project would contribute between 2 and 3 dB of these increases along these roadways. The City does not have a specific threshold of significance for project contributions to cumulative impacts.

It should be noted that the number of sensitive receptors along these roadways is limited. There are currently no residences or other noise-sensitive uses along four of these five segments: San Pablo Avenue between Highway 4 and Linus Pauling, John Muir Parkway west of San Pablo Avenue, Sycamore Avenue between Tsushima and South Front Street, and Sycamore Avenue between South Front Street and San Pablo Avenue. The proposed project and other planned projects would place new housing along these segments. Mitigation measures identified above and in the environmental analysis for the proposed Hercules New Town Center would reduce the potential impacts to these new residents to a less than significant level. In addition, the planned commercial development along Sycamore Avenue between Tsushima and South Front (directly across Sycamore Avenue from the Sycamore Crossing site) would help to shield the existing residences there from roadway noise. However, there are existing live-work

units along Sycamore Avenue between Tsushima and South Front Street that would potentially be affected by noise increases greater than 3 dB(A). These residences are of recent construction, with dual-paned windows that would likely reduce interior noise levels. However, these segments would also exceed the 65 dB(A) noise standard. Further noise-reducing mitigation measures, such as additional insulation, sound walls, or other physical buffers are not feasible because these live-work units are already built and there is insufficient setback from the street to allow installation of noise barriers. Cumulative noise impacts along these segments would therefore be significant, based on conservative assumptions regarding sensitive receptors.

Mitigation Measures: No additional mitigation is feasible.

Significance after Mitigation: Significant and unavoidable.