5.7 NOISE

SUMMARY

Construction of the proposed project would require site preparation, utility infrastructure installation, and roadway and building construction. Each of these construction phases typically involves the use of heavy-duty equipment, all of which could expose off-site residents, students, employees, and visitors to temporary noise impacts. Section 11.44.080 of the City of Santa Clarita Noise Ordinance prohibits construction operations to occur within 300 feet of residentially zoned properties during early morning, evening, and nighttime hours, and all hours on Sundays and major holidays. Nonetheless, project construction noise would intermittently exceed the noise limits adopted for residential zones in Section 11.44.040 of the Noise Ordinance, resulting in temporary, unavoidably significant noise impacts at nearby residences.

After the project is built out, future traffic on the proposed roadway extensions through the site would generate noise that would have a less than significant impact on noise-sensitive receptors located adjacent to or near to those roadways. No significant unavoidable mobile source noise impacts would occur.

METHODOLOGY

Introduction to Noise

Noise is usually defined as unwanted sound. It is an undesirable by-product of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, and/or when it has adverse effects on health. The definition of noise as unwanted sound implies that it has an adverse effect on people and their environment.

Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). The human ear does not respond uniformly to sounds at all frequencies; for example, it is less sensitive to low and high frequencies than to medium frequencies that more closely correspond with human speech. In response to the sensitivity of the human ear to different frequencies, the A-weighted noise level (or scale), which corresponds better with people's subjective judgment of sound levels, has been developed. This A-weighted sound level, referenced in units of dB(A), is measured on a logarithmic scale such that a doubling of sound energy results in a 3 dB(A) increase in noise level. In general, changes in a community noise level of less than 3 dB(A) are not typically noticed by the human ear.[1] Changes from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. A greater than

1 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (1980), 81.

5 dB(A) increase is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound.

Noise sources occur in two forms: (1) point sources, such as stationary equipment or individual motor vehicles; and (2) line sources, such as a roadway with a large number of point sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dB(A) for each doubling of distance from the source to the receptor at acoustically "hard" sites and 7.5 dB at acoustically "soft" sites.[2] For example, a 60 dB(A) noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dB(A) at 100 feet from the source and 48 dB(A) at 200 feet from the source. Sound generated by a line source typically attenuates (i.e., becomes less) at a rate of 3 dB(A) and 4.5 dB(A) per doubling of distance from the source to the receptor for hard and soft sites, respectively.[3] Sound levels can also be attenuated by man-made or natural barriers (e.g., sound walls, berms, ridges), as well as elevational differences, as illustrated in **Figure 5.7-1, Noise Attenuation by Barriers and Elevational Differences**.

Solid walls and berms may reduce noise levels by 5 to 10 dB(A) depending on their height and distance relative to the noise source and the noise receptor.[4] Sound levels may also be attenuated 3 to 5 dB(A) by a first row of houses and 1.5 dB(A) for each additional row of houses.[5] The minimum noise attenuation provided by typical structures in California is provided in **Table 5.7-1, Outside-to-Inside Noise Attenuation**.

When assessing community reaction to noise, there is an obvious need for a scale that averages varying noise exposure over time and that quantifies the result in terms of a single number descriptor. Several scales have been developed that address community noise level. Those that are applicable to this analysis are the Equivalent Noise Level (L_{eq}) and the Community Noise Equivalent Level (CNEL).[6]

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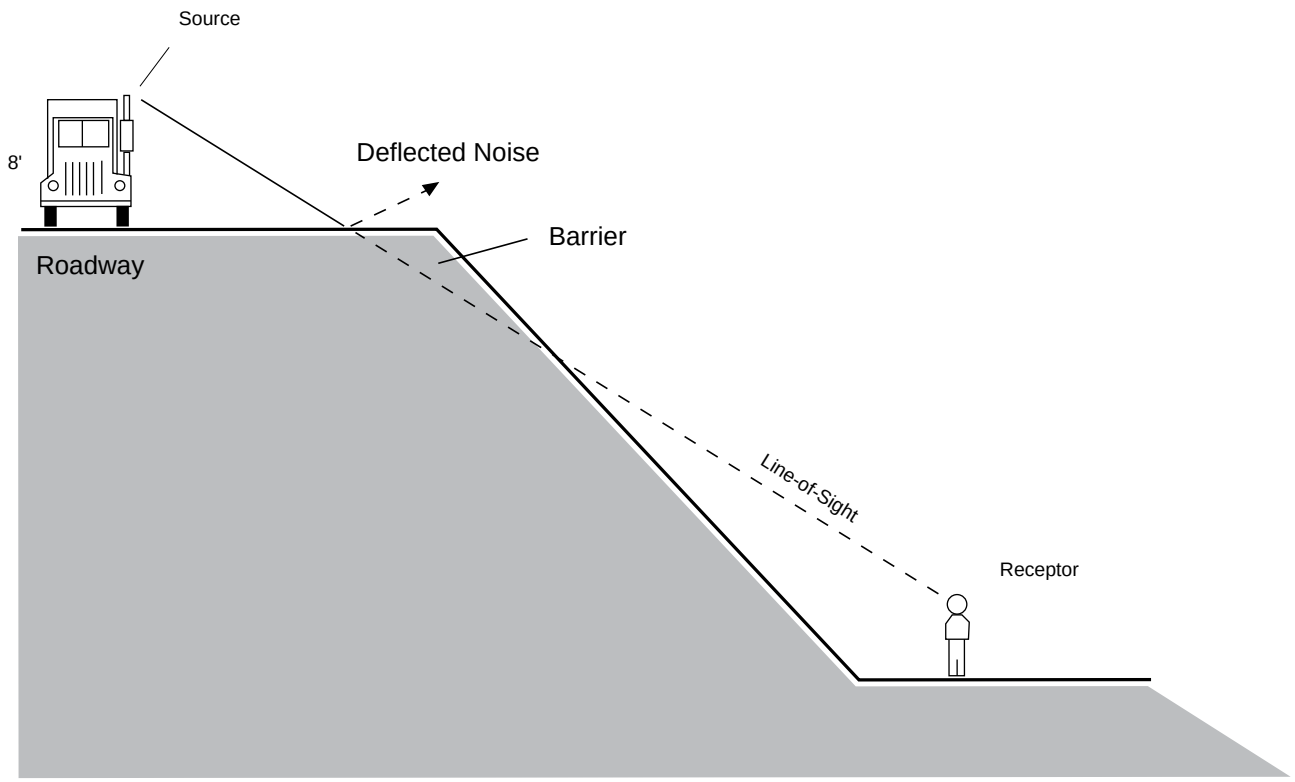
2 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (1980), 97. Examples of "hard" or reflective sites include asphalt, concrete, and hard and sparsely vegetated soils. Examples of acoustically "soft" or absorptive sites include soft, sand, plowed farmland, grass, crops, heavy ground cover, etc.

3 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (1980), 97.

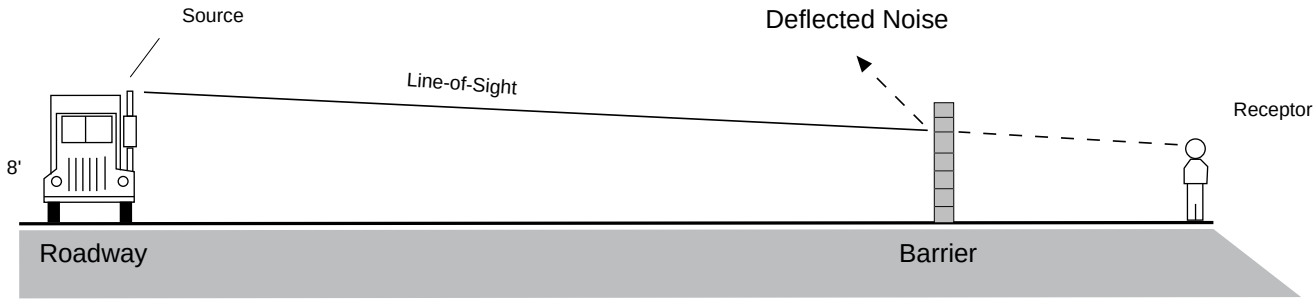
4 US Department of Transportation, Federal Highway Administration, *Highway Noise Mitigation*, (1980), 18.

5 T. M. Barry and J. A. Reagan, *FHWA Highway Traffic Noise Prediction Model*, (U.S. Department of Transportation, Federal Highway Administration, Office of Research, Office of Environmental Policy, 1978), NTIS, FHWA-RD-77-108, 33.

6 The Noise Element indicates considers both CNEL and Ldn equivalent for purposes of analysis. CNEL, however, is used for the noise impact analysis because it is more conservative than the Ldn and portrays a worst-case noise scenario, and it is commonly used throughout the State of California in noise impact analysis prepared for EIRs.



"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

SOURCE: Impact Sciences, Inc. – October 2004

FIGURE **5.7-1**

Noise Attenuation by Barriers and Elevation Differences

L_{eq} is the average A-weighted sound level measured over a given time interval. L_{eq} can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.

Table 5.7-1
Outside-to-Inside Noise Attenuation (dB(A))

Building Type	Open Windows	Closed Windows
Hotels/Motels	17	25
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30

Source: Gordon, C.G., W.J. Galloway, B.A. Kugler, and D.L. Nelson. NCHRP Report 117: Highway Noise: A Design Guide for Highway Engineers. Washington, D.C.: Transportation Research Board, National Research Council, 1971.

CNEL is another average A-weighted sound level measured over a 24-hour time period. However, this noise scale is adjusted to account for some individuals' increased sensitivity to noise levels during the evening and nighttime hours. A CNEL noise measurement is obtained after adding 5 dB to the measured hourly L_{eq} ($L_{eq(h)}$) occurring during the evening from 7:00 PM to 10:00 PM, and 10 dB to the measured $L_{eq(h)}$ occurring during the nighttime from 10:00 PM to 7:00 AM. The 5 and 10 dB additions are applied to account for peoples' increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding the 5 and 10 dB increments results in a CNEL measurement that is within approximately 3 dB(A) of the peak hour L_{eq}.[7]

Introduction to Vibration

Vibration consists of waves transmitted through solid material. Ground-borne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be comprised of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum" of many frequencies, and are generally classified as broadband or random

7 California Department of Transportation, *Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol*, (1998), N51-N54.

vibrations. The normal frequency range of most ground-borne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration is often measured in terms of the peak particle velocity (PPV) in inches per second (in/sec) because it best correlates with human perception.

Vibration energy attenuates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that in the far-field from a source, the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When ground-borne vibration interacts with a building, there is usually a ground-to-foundation coupling loss, but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or of items on shelves, or the motion of building surfaces.

Ground-borne vibration is generally limited to areas within a few hundred feet of certain types of construction activities, especially pile driving. Road vehicles rarely create enough ground-borne vibration to be perceptible to humans unless the road surface is poorly maintained and there are potholes or bumps. If traffic, typically heavy trucks, induces perceptible vibration in buildings, such as window rattling or shaking of small loose items, then it is most likely an effect of low-frequency air-borne noise or ground characteristics.

Human annoyance by vibration is related to the number and duration of events. The more events or the greater the duration, the more annoying it will be to humans.

Noise Analysis Purpose and Methodology

Purpose of Analysis

The purpose of this noise analysis is twofold: (1) to evaluate the proposed project in terms of its design to ensure that land uses are planned appropriately from a noise perspective, and (2) to evaluate the noise impact of the project (during both construction and operation) on the on-site and surrounding (off-site) land uses.

The primary concern regarding on-site noise is the potential for proposed on-site land uses to be exposed to noise levels that exceed adopted or recommended thresholds (discussed later in this EIR section). Potential noise increases at off-site locations due to future on-site activities and the addition of project-related traffic along roadway segments adjoining noise sensitive uses (i.e., uses that would be most sensitive to an increase in noise levels) were calculated. Noise sensitive uses include residential uses, transient lodging, schools, libraries, places of worship, hospitals, day care centers, and nursing

homes. Noise levels on roadway segments that are projected to carry project traffic were modeled both with and without the project's traffic volumes to determine if the project would cause a significant noise impact on existing nearby noise sensitive uses.

Analysis Methodology

Point Source Noise

Determination of future point source noise levels on the project site and in its vicinity is based upon land use, and available technical reports and literature that are cited throughout this EIR section.

Mobile Source Noise

Future on-site and off-site mobile source noise levels were calculated using future roadway traffic volume data from master plans College Master Plan Traffic Impact Analysis prepared by Austin-Foust Associates, Inc., (June 2008), and the Federal Highway Administration Highway (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry; distances between the noise source and the receptor; and other noise attenuating conditions at these locations. The average vehicle noise rates (energy rates) utilized in the model have been modified by Caltrans to reflect average vehicle noise rates identified for California. The Caltrans data show that California automobile noise is 0.8 to 1.0 dB(A) higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dB(A) lower than national levels.[8]

PLANS AND POLICIES FOR NOISE CONTROL

Plans and policies that pertain to the noise conditions affecting and affected by the proposed project include (1) the State of California, Department of Health Services, Environmental Health Division Guidelines for Noise and Land Use Compatibility, (2) California Noise Insulation Standards, (3) the Noise Element of the *City of Santa Clarita General Plan* and (4) the City's Noise Ordinance. Standards for vibration have been put forth by the Federal Transit Administration and Caltrans. These are also discussed below.

8 Rudolf W. Hendriks, *California Vehicle Noise Emission Levels*, (California Department of Transportation, 1987), NTIS, FHWA/CA/TL-87/03.

Noise Criteria

California Department of Health Services

In 1972, the United States Environmental Protection Agency (US EPA) determined that a yearly average day-night sound level of 45 dB(A) would permit adequate speech communication in the home. The US EPA also identified an indoor day/night level of 45 dB(A) as necessary to protect against sleep interference.[9]

Using this information and knowing that residential construction can attenuate noise by at least 25 dB(A) with windows and doors closed (see **Table 5.7-1, Outside-to-Inside Noise Attenuation**), the State of California, Department of Health Services, Environmental Health Division (DHS), developed and published recommended guidelines for noise and land use compatibility, referred to as the *State Land Use Compatibility Guidelines* (see **Figure 5.7-2, State Land Use Compatibility Guidelines for Noise**). The DHS does not mandate application of this compatibility matrix to development projects; however, each jurisdiction is required to consider the *State Land Use Compatibility Guidelines* when developing its general plan noise element and when determining acceptable noise levels within its community.[10]

The *State Land Use Compatibility Guidelines* identify an exterior (outdoor) noise level of 60 dB(A) CNEL to be an acceptable level for single family, duplex, and mobile homes involving normal, conventional construction, without any special noise insulation requirements (normally acceptable noise levels). Exterior noise levels up to 65 dB(A) CNEL/L_{dn} are typically considered acceptable for multi-family units and transient lodging without any special noise insulation requirements because interior noise levels will typically be reduced to acceptable levels (to at least 45 dB(A) CNEL/L_{dn}) through conventional construction, but with closed windows and fresh air supply systems or air conditioning. Between these values and 70 dB(A) CNEL/L_{dn}, exterior noise levels are typically considered acceptable only if the buildings are conditioned to include noise insulation features (conditionally acceptable noise levels) to achieve the 45 dB(A) CNEL/L_{dn} interior noise level.

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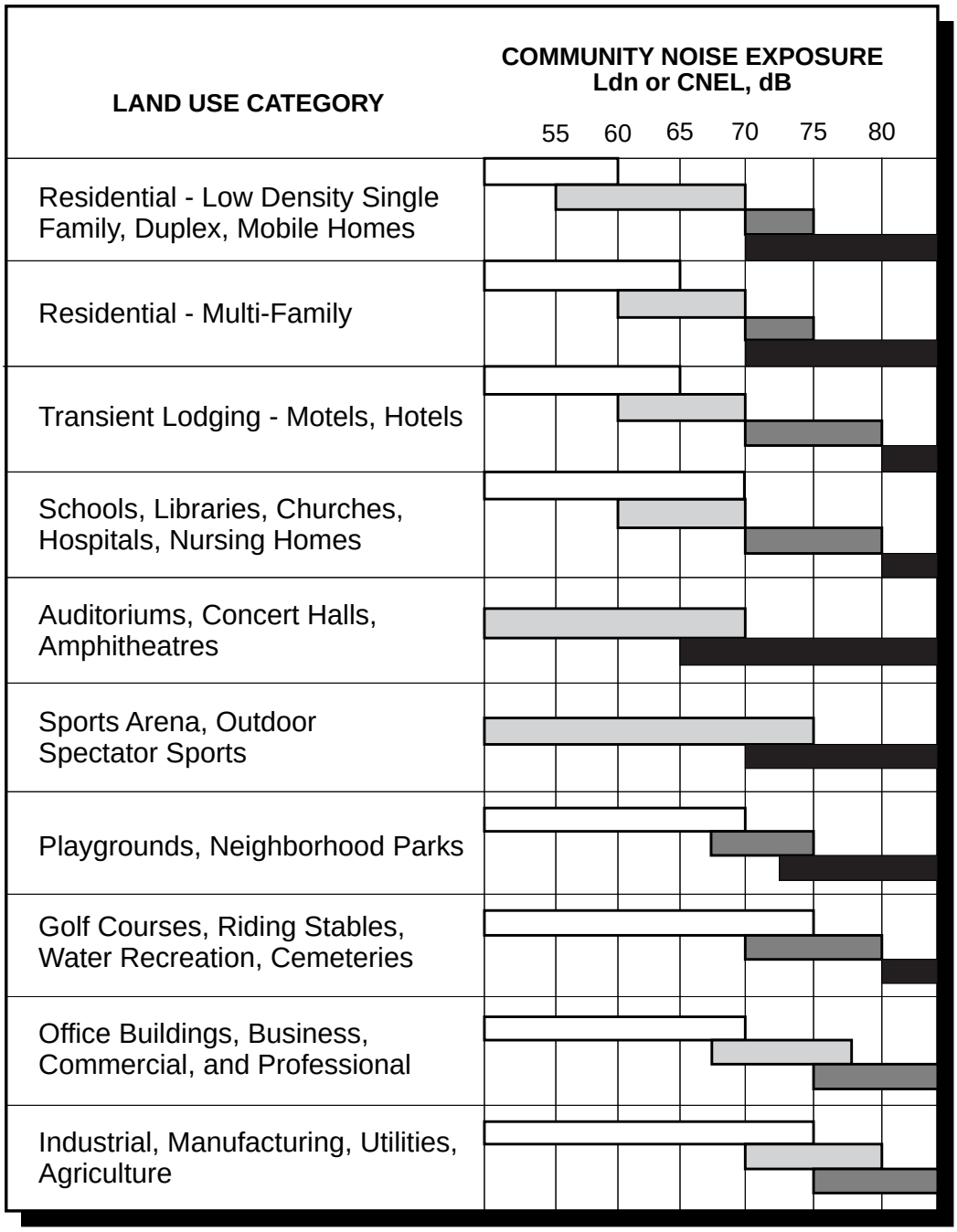
9 Dr. Alice H. Suter. "Administrative Conference of the United States: Noise and Its Effects, (November 1991)." http://www.nonoise.org/library/suter/suter.htm. 2004.

10 These guidelines are also published by the Governor's Office and Planning and Research in the *State of California General Plan Guidelines* (2003).



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

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

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

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

SOURCE: California Department of Health, Office of Health Control, Guidelines for the Preparation and Content of Noise Elements of the General Plan, February 1976.

FIGURE **5.7-2**

State Land Use Compatibility Guidelines for Noise

An exterior noise level of 70 dB(A) CNEL/L_{dn} is typically the dividing line between an acceptable and unacceptable exterior noise environment for all noise sensitive uses, including schools, libraries, places of worship, hospitals, day care centers, and nursing homes of conventional construction. Noise levels above 75 dB(A) CNEL/L_{dn} may be considered normally unacceptable for office, commercial, and industrial uses.

California Noise Insulation Standards

The California Noise Insulation Standards of 1988 (California Code of Regulations Title 24, Section 3501 et seq.) require that interior noise levels from exterior sources be 45 dB(A) or less in any habitable room of a multi-residential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings) with doors and windows closed. Measurements are based on CNEL or L_{dn}, whichever is consistent with the noise element of the local general plan. Where exterior noise levels exceed 60 dB(A) CNEL/L_{dn}, an acoustical analysis for new development is required to show that the proposed construction will reduce interior noise levels to 45 dB(A) CNEL/L_{dn}. If the interior 45 dB(A) CNEL/L_{dn} limit can be achieved only with the windows closed, the residence design must include mechanical ventilation that meets applicable Uniform Building Code (UBC) requirements.

In unacceptable interior noise environments, additional noise insulation features, such as extra batting or resilient channels[11] in exterior walls, double paned windows, air conditioners to enable occupants to keep their windows closed, solid wood doors, noise baffles on exterior vents, etc., are typically needed to provide acceptable interior noise levels. The best type of noise insulation for a land use should be based on detailed acoustical analyses that identify all practical noise insulation features and that confirm their effectiveness.

City of Santa Clarita Noise Element

The City has incorporated a slightly modified version of the *State Land Use Compatibility Guidelines* into its Noise Element (pp. N-6 and N-7), as well as noise level control standards that directly affect the proposed project.[12] These are used in this impact analysis as standards (measured in dB(A) CNEL) to measure noise impacts; therefore, application of these guidelines to both on- and off-site project-related noise would meet the City's impact analysis requirements. The guidelines in the City's Noise Element are

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11 A resilient channel is a pre-formed section of sheet metal approximately 0.5-inch deep by 2.5-inches wide by 12-inches long that is installed between wallboard panels and framing to reduce sound transmission through walls. By preventing the wallboard from lying against the studs, the channel inhibits the transmission of sound through the framing.

12 City of Santa Clarita, "Noise Element Amendment," General Plan (2000), N-7. The General Plan Noise Element may be found at the City of Santa Clarita Planning Department. The Noise Ordinance is found at http://www.santa-clarita.com/cityhall/admin/code/Santa_Clarita_Municipal_Code/Title_11/44/index.html.

referred to as the *City Land Use Compatibility Guidelines* (see **Figure 5.7-3, City Land Use Compatibility Guidelines for Noise**). The Noise Element is herein incorporated by reference and is available for review at the City of Santa Clarita Planning and Community Development Department.

City of Santa Clarita Noise Ordinance

The City has also adopted an ordinance to control point source noise. This ordinance is also incorporated herein by reference and is available for review at the City's website at http://www.santa-clarita.com/cityhall/admin/code/. Three sections of the ordinance are particularly pertinent to the proposed project: Sections 11.44.040, 11.44.070, and 11.44.080, as amended.

Section 11.44.040

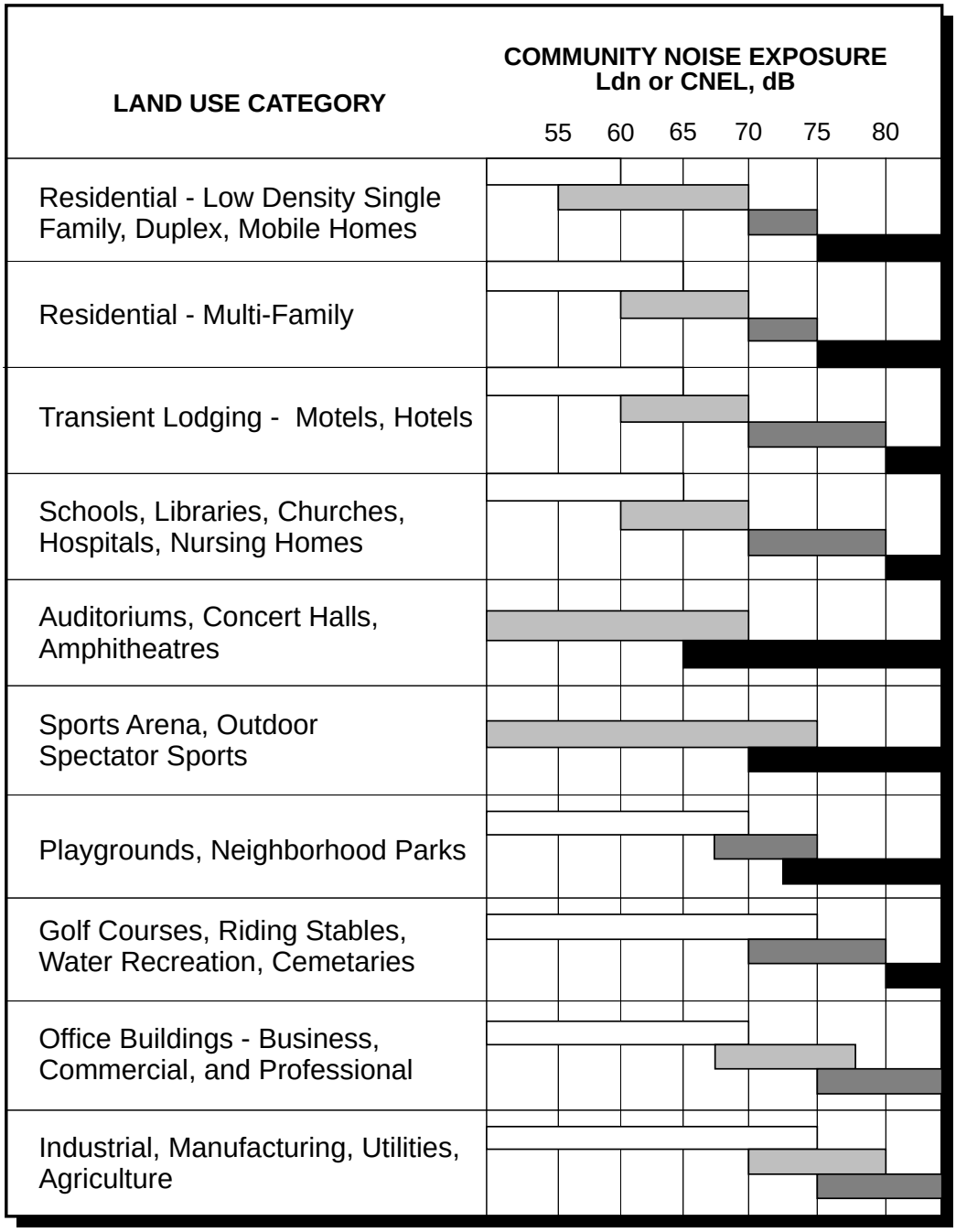
In general, Section 11.40.040, Noise Limits, sets the following noise levels for residential, commercial, and manufacturing uses taking place on private property and for construction activities on private property outside of the hourly limits provided in Section 11.40.080 as shown in **Table 5.7-2, City Ordinance Noise Limits**.

Table 5.7-2
City Ordinance Noise Limits

Region	Time	Exterior Sound Level (dB)
Residential Zone	Day	65
Residential Zone	Night	55
Commercial and Manufacturing	Day	80
Commercial and Manufacturing	Night	70

Wherever a boundary line occurs between a residential property and a commercial/manufacturing property, the noise level of the quieter zone is to be used. Construction work performed in conformance with Section 11.44.080 (below) is exempt from Section 11.44.040.[13] However, for purposes of identifying environmental impacts of development projects, the City uses the standards within Section 11.44.040 in environmental review documents. The standards included in Section 11.44.040 are used in the impact analysis below.

13 Jeff Hogan, City of Santa Clarita Planning and Building Services Department, personal communication, December 2003.



SOURCE: City of Santa Clarita General Plan Noise Element (May 23, 2000) Exhibit N-2

FIGURE **5.7-3**

City of Santa Clarita Guidelines for Noise and Land Use Compatibility

Section 11.44.070

Section 11.44.070 states, "any noise level from the use or operation of any machinery, equipment, pump, fan, air conditioning apparatus, refrigerating equipment, motor vehicle, or other mechanical or electrical device, or in repairing or rebuilding any motor vehicle, which exceeds the noise limits as set forth in Section 11.44.040 at any property line, or, if a condominium or rental units, within any condominium or rental unit within the complex, shall be a violation of this chapter." Construction work performed in conformance with Section 11.44.080 (below) is exempt from Section 11.44.070.[14]

Section 11.44.080, as Amended

Finally, Section 11.44.080, as amended by Ordinance No. 93-4 and No. 00-3, prohibits construction work requiring a building permit on sites within 300 feet of a residentially zoned property from operating except between the hours of 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturday. Construction work is prohibited on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day. The Public Works Department of the City of Santa Clarita may issue a permit for work to be done outside of these hours provided that containment of construction noise is provided. Section 11.44.080, as amended, represents an exception to Section 11.44.040 and 11.44.070 of the Noise Ordinance.[15]

Vibration Criteria

Federal Criteria

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction activities, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for non-engineered timber and mason buildings (e.g., residential units) is 0.2 in/sec PPV. [16] The threshold of perception of vibration is 0.01 in/sec PPV.

There are no FHWA standards for traffic-related vibrations. The FHWA position is that highway traffic and construction vibrations pose no threat to buildings and structures.[17]

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14 Ibid.

15 Ibid.

16 Federal Transit Administration, Office of Planning and Environment, *Transit Noise and Vibration Impact Assessment* FTA-VA-90-1003-06 (2006), 12–13.

17 California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601 (2002), 10.

California Department of Transportation.

There are no state standards for traffic-related vibrations. California Department of Transportation's (Caltrans) position is that highway traffic and construction vibrations generally pose no threat to buildings and structures.[18] For continuous (or steady-state) vibrations; however, Caltrans considers the architectural damage risk level to be somewhere between 0.2 and 2.0 in/sec.[19]

EXISTING CONDITIONS

Vehicular traffic is the dominant source of noise on and in the vicinity of the project site. Other sources of noise in the area that could potentially affect noise levels on the project site include nearby residential and non-residential uses. These noise sources are discussed below.

On- and Off-Site Measured Ambient Noise Levels

Twenty-four hour sound level measurements were taken on December 4, 5, 6, 7, and 8 (weekday), 2006 at nine locations on and near the project site in order to characterize the ambient[20] noise environment. **Figure 5.7-4**, **Noise Monitoring Locations**, depict the nine monitoring locations. The measurements were taken using Larson Model 720 sound level meters, which satisfy the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. The sound meters were equipped with an omni-directional microphone, calibrated before the day's measurements, and set at 5 feet above ground. Weather conditions were clear with little to no wind. The resulting noise levels are provided in **Table 5.7-3, Existing Weekday Sound Levels**. The measurements include both mobile (traffic) and point source noise.

Point sources of noise in the project area include people talking, doors slamming, truck deliveries, parking lot cleaning, lawn care equipment operation, stereos, domestic animals, etc. Noise levels generated by these sources contribute to the ambient noise levels that are experienced in all similarly developed areas. As demonstrated in **Table 5.7-3**, ambient noise levels at locations setback from Placerita Canyon Road, Placeritos Boulevard, and Dockweiler Drive are below 60 dB(A) CNEL, which is the acceptable noise threshold for single-family residences of the *City Land Use Compatibility Guidelines*.

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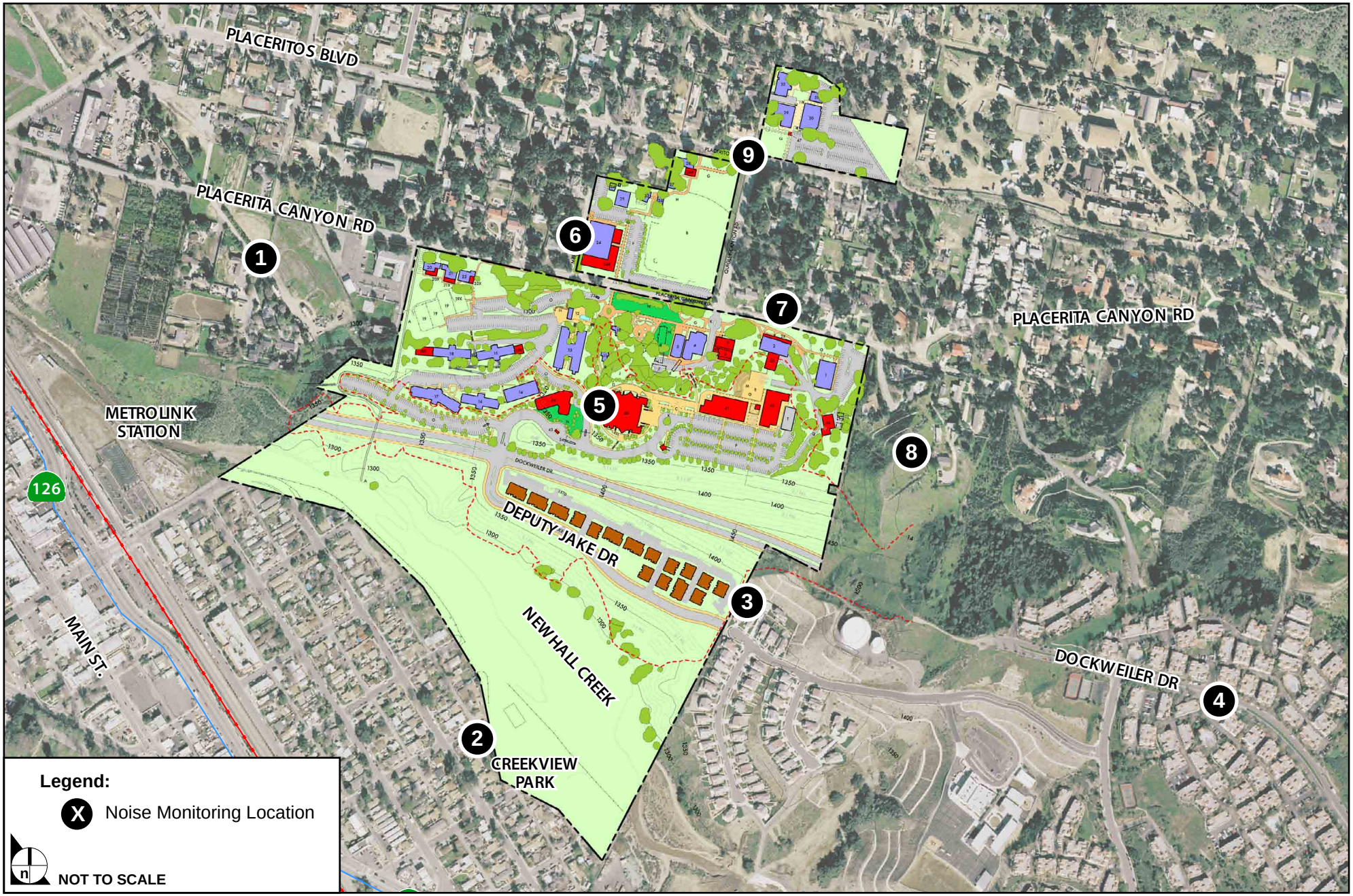
18 Ibid.

19 California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601 (2002), 12.

20 Ambient noise level is the level of existing noise occurring in the surrounding area, sometimes referred to as background noise.



SOURCE: Impact Sciences, Inc. – January 2007

FIGURE **5.7-4**

Noise Monitoring Locations

112-020•06/08

Table 5.7-3
Existing Weekday Sound Levels

Map Ref.	Location	Noise Level dB(A) CNEL
1	Off Site: West of The Master's College	57
2	Off Site: Park at 2nd Street/Race Street South of The Master's College	59
3	Off Site: End of Deputy Jake Drive Cul-de-Sac	58
4	Off Site: Dockweiler Drive	65
5	On Site: Hill Behind Rutherford Building	51
6	On Site: Next to Bross Gymnasium on Placerita Canyon Road/Meadview Avenue	57
7	Off Site: North Side of Placerita Canyon Road and Dunkin Student Center	65
8	Off Site: Residence East of Masters College	53
9	On Site: Placeritos Boulevard/Quigley Canyon Road	63

Source: Impact Sciences, Inc.
The 24-hour noise measurements are provided in ***Appendix 5.7*** *of this EIR.*

On- and Off-Site Modeled Mobile Source Noise Levels

Existing average traffic noise levels were calculated at noise sensitive receptors along roadway segments in the project study area[21] using the FHWA model. The modeled noise results are summarized in **Table 5.7-4, Modeled Roadway Noise Levels – Existing Conditions**. As shown, the modeled noise levels are within normally and conditionally acceptable noise levels under the *City Land Use Compatibility Guidelines*.

PROJECT IMPACTS

Significance Thresholds Criteria

According to the City of Santa Clarita Environmental Guidelines, a project would have a significant effect on the environment if it would

21 The geographic limits of the project study area are illustrated in Figure 1-3 of *The Master*'s *College Master Plan Traffic Impact Analysis* (2008) provided in **Appendix 4.3** of this EIR. In general, it includes all roadway segments and intersections that would be affected by project traffic.

Table 5.7-4
Modeled Roadway Noise Levels – Existing Conditions

Roadway Segment	Land Use	Existing (2007) CNEL[1]
Newhall Ave. w/o Sierra Highway	Mixed Residential	66
Lyons Ave. w/o Main St.	School	66
Placerita Canyon Rd. w/o The Master's College	Church	62
Placerita Canyon Rd. w/o Sierra Highway	Single-Family Residential	59
12th St. s/o Placeritos Blvd.	Single-Family Residential	58
Placeritos Blvd. w/o Meadview	Single-Family Residential	57
Dockweiler Rd. w/o Sierra Highway	Multi-Family Residential	58
Valle del Oro n/o Newhall Ave.	Multi-Family Residential	58

Source: Impact Sciences, Inc. Calculations are in ***Appendix 5.7****.*
n/o = north of, e/o = east of, s/o = south of, w/o = west of, n/a = not available
[1] *All numbers are rounded to the nearest whole number.*

- expose 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;
- expose persons to or generation of excessive ground-borne noise levels;
- cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The following thresholds of significance are based on the *City Land Use Compatibility Guidelines*, as well as the noise standards outlined in the City's Noise Ordinance.

Construction Noise

As stated previously, for purposes of identifying and analyzing environmental impacts of development projects, the City uses the standards within City's Noise Ordinance in environmental review documents. If components of the proposed project and/or off-site noise-sensitive were to be subject to project-related

construction noise levels originating on or off The Master's College site that would be in violation of Sections 11.44.040 and 11.44.070 of the City's Noise Ordinance, or in excess of normally acceptable noise levels of the *City Land Use Compatibility Guidelines*, a significant on-site noise impact would occur.

Operational Noise

Should stationary source noise from activities on the project site exceed limits of Sections 11.44.040 and 11.44.070 of the City's Noise Ordinance, a significant noise impact would occur.

The proposed project would result in a significant on-site mobile source noise impact if traffic on adjacent and nearby roadways would cause on-site exterior use areas to be exposed to continuous noise levels greater than those identified in the *City Land Use Compatibility Guidelines* for the affected land use.

Evaluation of off-site mobile source noise impacts considers the *City Land Use Compatibility Guidelines* and community responses to changes in noise levels. As discussed previously, changes in a noise level of less than 3.0 dB(A) are not typically noticed by the human ear.[22] Changes from 3.0 to 5.0 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. A 5.0 dB(A) increase is readily noticeable. Based on this information, significant off-site project operational noise impacts would occur under the following criteria:

- Criterion 1 – an increase of 5.0 dB(A) or greater in noise level occurs from project-related activities if levels remain within the same land use compatibility classification (e.g., noise levels remain within the normally acceptable range); or
- Criterion 2 – an increase of 3.0 dB(A) or greater in noise level occurs from project-related activities which results in a change in land use compatibility classification (e.g., noise levels change from normally acceptable to conditionally acceptable); or
- Criterion 3 – any increase in noise levels occurs where existing noise levels are already considered unacceptable under the *City Land Use Compatibility Guidelines*.

Construction-Related Impacts

Project development activities would occur over approximately 10 years and would primarily include site preparation (demolition, grading, and excavation); construction of internal roadways, driveways, and structures; and construction of the Dockweiler Drive and Deputy Jake Drive extensions. Proposed grading includes the movement of approximately 1.2 million cubic yards of earth., The majority of grading would be associated with the proposed connection of Dockweiler Drive from its existing

22 *Highway Noise Fundamentals,* (US Department of Transportation, Federal Highway Administration, 1980), 81.

terminus to the North Newhall Specific Plan connection. No import or export of earthen materials to or from the site would occur.

Site preparation typically involves the use of heavy equipment, such as scrapers, tractors, loaders, concrete mixers, cranes, etc. Trucks would be used to deliver equipment and building materials, and to haul away waste materials. Smaller equipment, such as jackhammers, pneumatic tools, saws, and hammers would also be used throughout the site during the construction phases. No pile driving would occur during project construction.

The US EPA has compiled data on the noise-generating characteristics of specific types of construction equipment. These data are presented in **Figure 5.7-5, Noise Levels of Typical Construction Equipment**. As shown, noise levels generated by heavy equipment can range from approximately 68 dB(A) to noise levels in excess of 100 dB(A) when measured at 50 feet. However, these noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6.0 to 7.5 dB(A) per doubling of distance. For example, assuming a "hard" site, a noise level of 68 dB(A) measured at 50 feet from the noise source to the receptor would reduce to 62 dB(A) at 100 feet from the source to the receptor, and further reduce by another 6.0 dB(A) to 56 dB(A) at 200 feet from the source to the receptor.

In general, the first and noisiest stage is site preparation. The highest noise levels during this phase would be associated with the operation of heavy-duty trucks, scrapers, graders, backhoes, and front-end loaders. When construction equipment is operating, noise levels can range from 73 to 96 dB(A) at a distance of 50 feet from individual pieces of equipment. During the second stage of construction, foundation forms are constructed and concrete foundations are poured. Primary noise sources include heavy concrete trucks and mixers, cranes, and pneumatic drills. At 50 feet from the source, noise levels in the 70 to 90 dB(A) range are common.

The third and fourth stages consist of interior and exterior building construction, and site cleanup. Primary noise sources associated with the third phase include hammering, diesel generators, compressors, and light truck traffic. Noise levels are typically in the 60 to 80 dB(A) range at a distance of 50 feet. The final stages typically involve the use of trucks, landscape rollers and compactors, with noise levels in the 65 to 75 dB(A) range.

Noise levels generated during the construction phases would, affect occupants of existing on-site uses and uses constructed in the project's early development phases, as well as nearby residences and church. Any on- or off-site location with an uninterrupted line of sight to the construction noise sources could periodically be exposed to temporary noise levels that could exceed normally acceptable noise levels from the *City Land Use Compatibility Guidelines*, which would be a significant impact.

Demolition Noise Impacts

The removal of parking and older buildings along Placerita Canyon Road to allow for the creation of a large green space and garden area. Noise levels can exceed 96 dB(A) at 50 feet during demolition and would be audible at single-family residences to the north of Placerita Canyon Road. Because these noise levels would exceed the normally acceptable noise level of 60 dB(A) for single-family residences, they would be significant.

Grading Noise Impacts

On-Site Grading Activities

Grading would occur on the Hilltop Campus north of Dockweiler Drive to create building pads, driveways, parking areas, the outdoor amphitheater, and landscaping. Short-term grading operations would occur in close proximity to existing dormitories (Hotchkiss Hall, southern face only; Slight Hall, eastern and southern faces; and Waldock and C.W. Smith Halls, southern faces only). In some locations, grading would occur as close as 20 feet from the dormitories, and be exposed to noise levels in excess of 96 dB(A). Because noise levels would exceed the normally acceptable noise level of 65 dB(A) for multi-family residences/transient lodging, they would be significant.

Grading would also occur along the eastern site boundary south of Dockweiler and Deputy Jake Drives. In some locations, the grading activities would be within 20 feet of four single-family residences within Tract 53114 (Lots 1, 2, 51, and 53). These residences would experience temporary grading noise levels in excess of 96 dB(A), assuming a hard surface and no other sources of noise attenuation. Other residences in the western portion of that tract that are further away from the grading would also experience noise levels in excess of 60 dB(A). Because noise levels would exceed the normally acceptable noise level of 60 dB(A) for singe family residences, they would be significant.

South of Lot 3 within Tract 53114, the grading would trend away from the tract so that noise levels at the single-family residences will drop off. Nonetheless, residences along the west side of Matthew Place and south of Deputy Jake Drive that will have a direct line of sight to the grading activities would be exposed to noise levels in excess of 60 dB(A), which would be a significant impact.

Roadway Extension and Water Tank Replacement Grading Activities

Construction of the Dockweiler Drive and Deputy Jake Drive roadway extensions would also require the majority of grading associated with the proposed project. Additionally, grading would occur within a 4.2-acre area east of master plan's College property as part of the proposed water tank replacement. East of the project site, the closest noise sensitive receptors to roadway grading would be the single-family

residences in Tract 53114. Residences in Tract 53114 would be approximately 200 feet from the nearest roadway grading activities and those residences with a direct line of sight to the grading would experience noise levels up to 84 dB(A), assuming a hard surface and no other sources of noise attenuation. Because noise levels would exceed the normally acceptable noise level of 60 dB(A) for single-family residences, they would be significant. Residences in Tract 53114 would not have a direct line of sight to grading activities north of the Dockweiler Drive extension and noise levels from these grading activities would be substantially less and less than significant.

West of the project site, single-family residences exist north of the proposed Dockweiler Drive extension. Any residence within 3,200 feet of the grading activities and with a direct line of sight to the activities could experience grading noise levels in excess of 60 dB(A), which would be a significant noise impact.

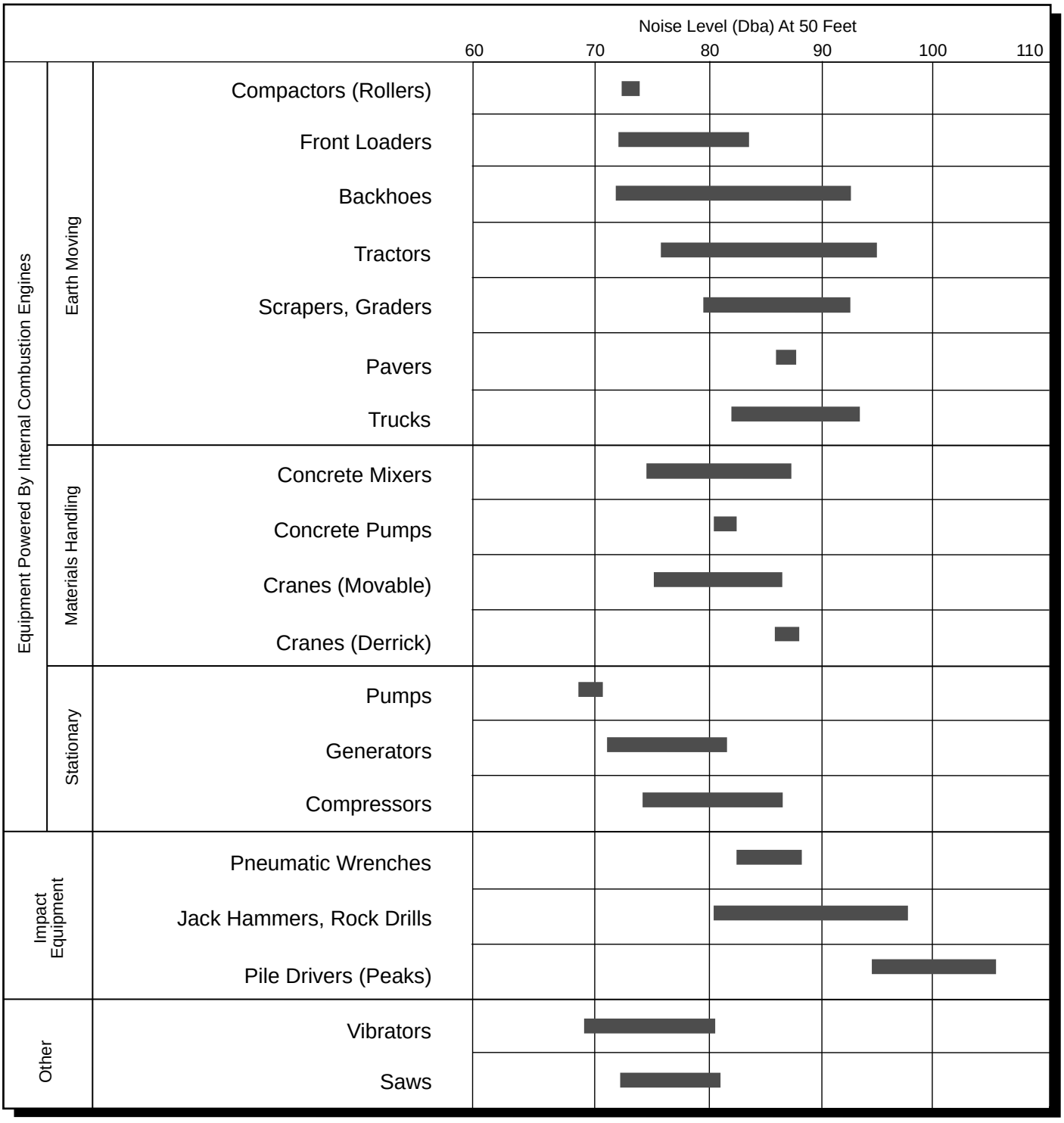
Building Construction Noise Impacts

Within the project site, existing buildings would be expanded and new buildings would be constructed. Additionally, an outdoor amphitheater and new parking lots would be constructed. These improvements are located throughout The Master's College campus and have the potential to adversely affect both on- and off-site noise sensitive receptors. **Table 5.7-5, Temporary Building Construction Noise Impacts**, identifies the construction noise sources, the nearest noise-sensitive receptors, and the potential for a significant noise impact given the proximity of the noise source to the receptor, as well as the existence of a direct line of sight between the two.

As shown in **Table 5.7-5**, construction of the Dixon and Sweazy Hall expansions, the Center for Professional Studies and Bross Gymnasium expansions, the McArthur Chapel Building, the new dormitory and maintenance building, condominiums on the west side of Tentative Tract 66503 could have a significant noise impact on nearby noise-sensitive receptors.

Construction Worker Mobile Source Noise Impacts

Heavy-duty on-road trucks that would be used to move construction equipment onto the project site and into construction areas typically have a noise level of approximately 90 dB(A) at 50 feet. Future on-site sensitive receptors constructed during the earlier phases of project development and off-site sensitive receptors located along the truck routes that would have a direct line of sight to the trucks would experience temporary, instantaneous noise levels up to approximately 90 dB(A) at 50 feet from the roadway. Receptors located further away would experience less noise due to their greater distance from the truck route, and to any intervening topography and/or structures that may exist between them and the noise source. Because the heavy equipment would remain at the construction sites for the duration of the construction phase, the noise impact on the sensitive receptors would only occur when the equipment is moved onto and off the construction sites, and would be temporary and instantaneous because the



Note: Based On Limited Available Data Samples.

SOURCE: United States Environmental Protection Agency, 1971, "Noise From Construction Equipment And Operations, Building Equipment, And Home Appliances," Ntid 300-1.

FIGURE **5.7-5**

Noise Levels of Typical Construction Equipment

noise levels would diminish rapidly as the trucks travel away from them. In short, heavy-duty construction truck traffic would be periodic and restricted to daytime hours, is expected to travel along highways and major arterials where less noise sensitive uses are or would be located, and is not expected to traverse residential streets. As such, short-term construction truck traffic would not result in a significant noise impact.

Table 5.7-5
Temporary Building Construction Noise Impacts

No.	Building Name	Approximate Distance to Off-Site Receptor[1]	Level of Significance
2	Expansion: Duncan Student Center/Mustang Grill – north side of existing building	Off-site residential 200 ft. to north; however, traffic Placerita Canyon Rd. traffic noise would drown out construction noise.	Less Than Significant
3	Expansion: Computer & Information Science Buildings	Off-site residential 200 ft. to north; however, traffic Placerita Canyon Rd. traffic noise would drown out construction noise.	Less Than Significant
15	Expansion: Dixon Hall Dorm	150 ft. direct line of sight to dormitories to east; 200 ft. direct line of sight to dormitories to south. Temporary construction noise levels up to 82 dB(A).	Significant
18	Expansion: Sweazy Hall	150 ft. direct line of sight to dormitories to south. Temporary construction noise levels up to 82 dB(A).	Significant
20	Expansion: Center for Professional Studies	100 ft. director line of site to off-site church to west. Temporary construction noise levels up to 84 dB(A).	Significant
21	Expansion: Center for Professional Studies	No direct line of sight to noise sensitive receptors.	Less Than Significant
22	Expansion: Home Economics Center	No direct line of sight to noise sensitive receptors.	Less Than Significant
24	Expansion: Bross Gymnasium	80 ft. direct line of sight to off-site single-family residence to west. Temporary construction noise levels up to 87 dB(A).	Significant
28	Expansion: Communications Center	No direct line of sight to noise sensitive receptors.	Less Than Significant
40	McArthur Chapel Building	200 ft. direct line of sight to dormitory to northwest; 175 ft. direct line of sight to proposed dormitory to west. Temporary construction noise levels up to 80 dB(A).	Significant
41	50-ft. Classroom Building	Off-site residential 475 ft. to north; however, traffic Placerita Canyon Road traffic noise would drown out construction noise. .	Less Than Significant

No.	Building Name	Approximate Distance to Off-Site Receptor[1]	Level of Significance
42	50-ft. Classroom Building	Off-site residential 350 ft. to north; however, traffic Placerita Canyon Road traffic noise would drown out construction noise. .	Less Than Significant
43	Security Guard House	Negligible source of construction noise.	Less Than Significant
44	Dormitory	175 ft. direct line of sight to proposed chapel to east. Temporary construction noise levels up to 80 dB(A).	Significant
		25 ft. direct line of sight to existing dormitory to west. Temporary construction noise levels up to 90 dB(A).	Significant
		100 ft. direct line of sight to existing dormitory to north. Temporary construction noise levels up to 84 dB(A).	Significant
45	Computer Science Building	No direct line of sight to noise sensitive receptors.	Less Than Significant
46	Maintenance Building	Partial direct line of sight to off-site residential 150 ft. to northeast. Temporary construction noise levels up to 82 dB(A).	Significant
47	Entry Tower	No direct line of sight to noise sensitive receptors.	Less Than Significant
F	Relocated/Reconfigured Parking	No direct line of sight to noise sensitive receptors.	Less Than Significant
M	Outdoor Amphitheater	Slope of amphitheater faces to the southeast. No direct line of sight to noise sensitive receptors.	Less Than Significant
O	Dormitory Parking	Temporary construction noise levels audible at nearby dormitories. Temporary construction noise levels up to 90 dB(A)	
P	Student/Faculty Parking	No direct line of sight to noise sensitive receptors.	Less Than Significant
Condominiums within Tentative Tract 66503		Condominium construction would be within 65 ft. of Lots 51 and 65. Temporary construction noise levels up to 90 dB(A).	Significant
Infrastructure Construction Along East Boundary South of Dockweiler Dr.		Temporary construction noise impacts up to 80 dB(A) at residences in Tract 53114.	Significant

Source: Impact Sciences, Inc.

[1] *Noise levels indicated assume a noise drop-off rate of 6 dB per doubling of distance for hard surfaces and no other sources of noise attenuation, unless indicated.*

Although the daily transportation of construction workers is expected to cause some increases in noise levels along roadways in the project study area, this traffic, which would be largely comprised of

passenger vehicles and pick-up trucks, would not represent a substantial percentage of daily volumes in the area over the course of infrastructure installation and construction, would contribute substantially less than 3 dB(A) to the ambient noise environment. This noise contribution would be inaudible to the typical human ear. Therefore, construction-worker traffic noise would be less than significant.

Conclusion

In order to reduce the potential impacts associated with construction activities, Section 11.44.080 of the City's Noise Ordinance restricts construction work requiring a building permit to between the hours of 7:00 AM and 7:00 PM Monday through Friday, and to between 8:00 AM and 6:00 PM on Saturday. The Noise Ordinance also precludes construction activities on Sundays and major holidays. These restrictions do not, however, mitigate the impact of construction noise that would be in excess of normally acceptable noise levels of the *City Land Use Compatibility Guidelines*. Therefore, the temporary project construction noise levels would be significant.

Project Operational Noise Impacts

As the project builds out, on- and off-site noise impacts would result from project-generated traffic, as well as from human activity on the project site itself. Each of these potential noise impacts is discussed separately below.

Mobile Source Noise Impacts

As stated in **Section 5.10, Transportation and Circulation**, of this EIR, the proposed project is projected to generate approximately 1,884 new vehicle trips per day on local roadways, including Dockweiler Drive, Placerita Canyon Road, Placeritos Boulevard, 12th Street, Newhall Avenue, Lyons Avenue, and Sierra Highway when fully operational. Post-project, interim year, on- and off-site traffic noise levels were projected using the FHWA Highway Traffic Noise Prediction Model.[23] **Table 5.7-6, Interim Year Mobile Source Noise Impacts**, provides interim year with and without project traffic noise levels at noise sensitive receptors in the project study area. As shown, implementation of the proposed project, including the Dockweiler Drive and Deputy Jake Drive extensions, would result in a noise increase of less than one decibel along most roadway segments analyzed. A reduction in noise level would occur along Placerita Canyon Road west of the site and along 12th Street due to a redistribution of traffic as a result of the roadway extension. Noise levels along the Dockweiler Drive extension east of The Master's College

[23] As previously discussed, the FHWA Noise Prediction Model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) utilized in the FHWA Model have been modified by the Caltrans to reflect average vehicle noise rates identified for California.

campus would increase by at least 4 decibels, but the noise increase would not be significant because it would not meet the criteria for off-site noise impact significance.

Construction of the 54 condominium units would occur in the future. The proposed project includes the extension of Dockweiler Drive to the western boundary of master plan's college property. The proposed North Newhall Specific Plan includes the further extension and connection of Dockweiler Drive to eventually allow traffic movement from Sierra Highway to Interstate 5. The precise location within the proposed North Newhall Specific Plan where Dockweiler Drive would be connected is still being determined. Therefore, traffic conditions and potentially significant mobile source noise impacts to the proposed condominium units cannot be predicted at this time. **Mitigation Measures 5.7-4** and **5.7-5** provided below would require further analysis of the ambient noise environment at the time the condominium units are constructed and the implementation of noise insulation features and balcony design and orientation, which would result in interior and exterior noise levels at the condominium units within the levels identified in the Noise Ordinance. Implementation of **Mitigation Measures 5.7-4** and **5.7-5** would reduce potentially significant impacts to a level of less than significant.

Point Source Noise Impacts

Future point sources of noise within the project site would be from people talking, doors slamming, truck deliveries, parking lot cleaning, lawn care equipment operation, stereos, domestic animals, etc. These are the same noise sources as currently occur at the site and contribute to the ambient noise levels that are experienced in all similarly developed areas. Noise levels generated by these sources would typically not exceed the City's Noise Ordinance or normally acceptable noise levels of the *City Land Use Compatibility Guidelines* due to their intermittent and instantaneous nature.

MITIGATION MEASURES ALREADY INCORPORATED INTO THE PROJECT

No mitigation measures for noise have been incorporated into the project.

MITIGATION MEASURES PROPOSED BY THIS EIR

Construction Noise Mitigation

5.7-1: Pursuant to Section 11.44.080 of the City's Noise Ordinance, no construction work shall occur within 300 feet of occupied residences except between the hours of 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturday. No construction work shall occur on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day.

5.7-2: When construction operations occur within 300 feet of on- or off-site occupied residences, and when it is determined by City staff during routine construction site inspections that the construction equipment could generate a noise level at those residences that would be in excess of normally acceptable noise levels of the *City Land Use Compatibility Guidelines*, the applicant shall implement appropriate additional noise reduction measures. These measures shall include among other things changing the location of stationary construction equipment, shutting off idling equipment, notifying residents in advance of construction work, and installing temporary acoustic barriers around stationary construction noise sources.

5.7-3: Construction staging areas shall be located on site to maximize the distance between staging areas and occupied on- and off-site residences.

Operational Noise Mitigation

5.7-4: Prior to issuance of building permits for the 54-unit condominium development identified in Tentative Tract Map 66503, a detailed acoustic analysis shall be performed by a qualified noise consultant to evaluate the ambient noise environment. The analysis shall be based upon final site grades, building orientation, and noise exposure, and shall specify all practical noise insulation features necessary to ensure interior residential noise environments do not exceed 45 dB(A). These noise insulation features shall be implemented and may include, but are not limited to, the following:

- All windows, both fixed and operable, shall consist of either double-strength glass or double-paned glass. All windows facing sound waves generated from the mobile source noise shall be manufactured and installed to specifications that prevent any sound from window vibration caused by the noise source.
- Doors shall solid core and shall be acoustically designed with gasketed stops and integral drop seals.
- If necessitated by the architectural design of a structure, special insulation or design features shall be installed to meet the required interior ambient noise level.
- The exterior walls of living areas shall be of a special type construction and/or include special insulation, depending on the maximum ambient noise levels generated at any time in a particular area.

Table 5.7-6
Interim Year Mobile Source Noise Impacts

Roadway Segment	Existing (2007) CNEL[1]	Interim Year without Project CNEL[1]	Interim Year with Project CNEL[1]	Project Noise Contribution dB(A)	Significance Criterion 1	Significance Criterion 2	Significance Criterion 3
Newhall Ave. w/o Sierra Highway	66	66	66	<1	NO	NO	NO
Lyons Ave. w/o Main St.	66	66	66	<1	NO	NO	NO
Placerita Canyon Rd. w/o Masters College	62	62	61	-1	NO	NO	NO
Placerita Canyon Rd. w/o Sierra Highway)	59	59	59	<1	NO	NO	NO
12th St. s/o Placeritos Blvd.	58	58	56	-2	NO	NO	NO
Placeritos Blvd. w/o Meadview	57	57	57	<1	NO	NO	NO
Dockweiler Rd. w/o Sierra Highway	58	59	63	4	NO	NO	NO
Valle de Oro n/o Newhall Ave	58	59	59	<1	NO	NO	NO

Source: Impact Sciences, Inc. Calculations are in ***Appendix 5.7****.*
n/o = north of, e/o = east of, s/o = south of, w/o = west of, n/a = not available
[1] *All numbers are rounded to the nearest whole number.*

5.7-5: Balconies are considered exterior living areas and must also meet the exterior noise standard. Therefore, based on the acoustic analysis required in **Mitigation Measure 5.7-4** balconies shall either be discouraged on residential units where they would be exposed to exterior noise levels greater than the 65 dB(A) CNEL standard for multi-family residences through architectural or site design, or balconies in such areas shall be enclosed by solid noise barriers, such as three-eighths-inch glass or five-eighths-inch Plexiglas to a height specified by a qualified noise consultant.

CUMULATIVE IMPACTS

The cumulative noise impacts for the project study area in the SCVCTM interim year are incorporated in the discussion under **Project Impacts**, above.

CUMULATIVE MITIGATION MEASURES

No significant cumulative noise impacts would result from Valley buildout, which would include the proposed project; consequently, no mitigation measures are recommended by this EIR.

UNAVOIDABLE SIGNIFICANT IMPACTS

Project-Specific Impacts

Mitigation measures recommended to reduce construction-related noise impacts would reduce the magnitude of those impacts; however, the potential for construction-related noise levels to exceed normally acceptable noise levels in the *City Land Use Compatibility Guidelines* would remain. Therefore, construction-related noise impacts are considered unavoidably significant.

Mobile source impacts during project operation would be reduced to a level of less than significant with implementation of recommended mitigation measures.

Project Cumulative Impacts

No significant cumulative noise impacts would result from Valley buildout, which would include the proposed project.