

## **INTRODUCTION**

*This section of the EIR presents the results of an analysis of both existing background conditions and future noise conditions following completion of the project. These findings also reflect the project traffic study, prepared by Linscott, Law and Greenspan in July 2006. Complete copies of the traffic analysis and the acoustic analysis data are contained in **Appendices 4.4 and 4.6** of this EIR, respectively.*

## **CHARACTERISTICS OF NOISE**

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

Sound pressure level alone is not a reliable indicator of loudness because 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 the medium frequencies that more closely correspond to human speech. In response to the human ear's sensitivity to different frequencies or lack thereof, the A-weighted noise level, referenced in units of dB(A), was developed to better correspond with peoples' subjective judgment of sound levels. In general, changes in a community noise level of less than 3 dB(A) are not typically noticed by the human ear.<sup>1</sup> Changes from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. An increase greater than 5 dB(A) is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound volume. A doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceptible change in sound level. Common noise levels associated with certain activities are shown on **Figure 4.6-1, Common Noise Levels**.

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 mobile point sources (motor vehicles). Sound generated by a stationary 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 at a

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<sup>1</sup> U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 81.

rate of 7.5 dB(A) at acoustically “soft” sites.<sup>2</sup> 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 it would be 48 dB(A) at 200 feet from the source. Sound generated by a line source typically attenuates 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.<sup>3</sup> Man-made or natural barriers can also attenuate sound levels, as illustrated in **Figure 4.6-2, Noise Attenuation by Barriers**.

Solid walls and berms may reduce noise levels by 5 to 10 dB(A).<sup>4</sup> The minimum attenuation of exterior to interior noise provided by typical structures in California is provided in **Table 4.6-1, Outside to Inside Noise Attenuation**.

**Table 4.6-1  
Outside to Inside Noise Attenuation (dB(A))**

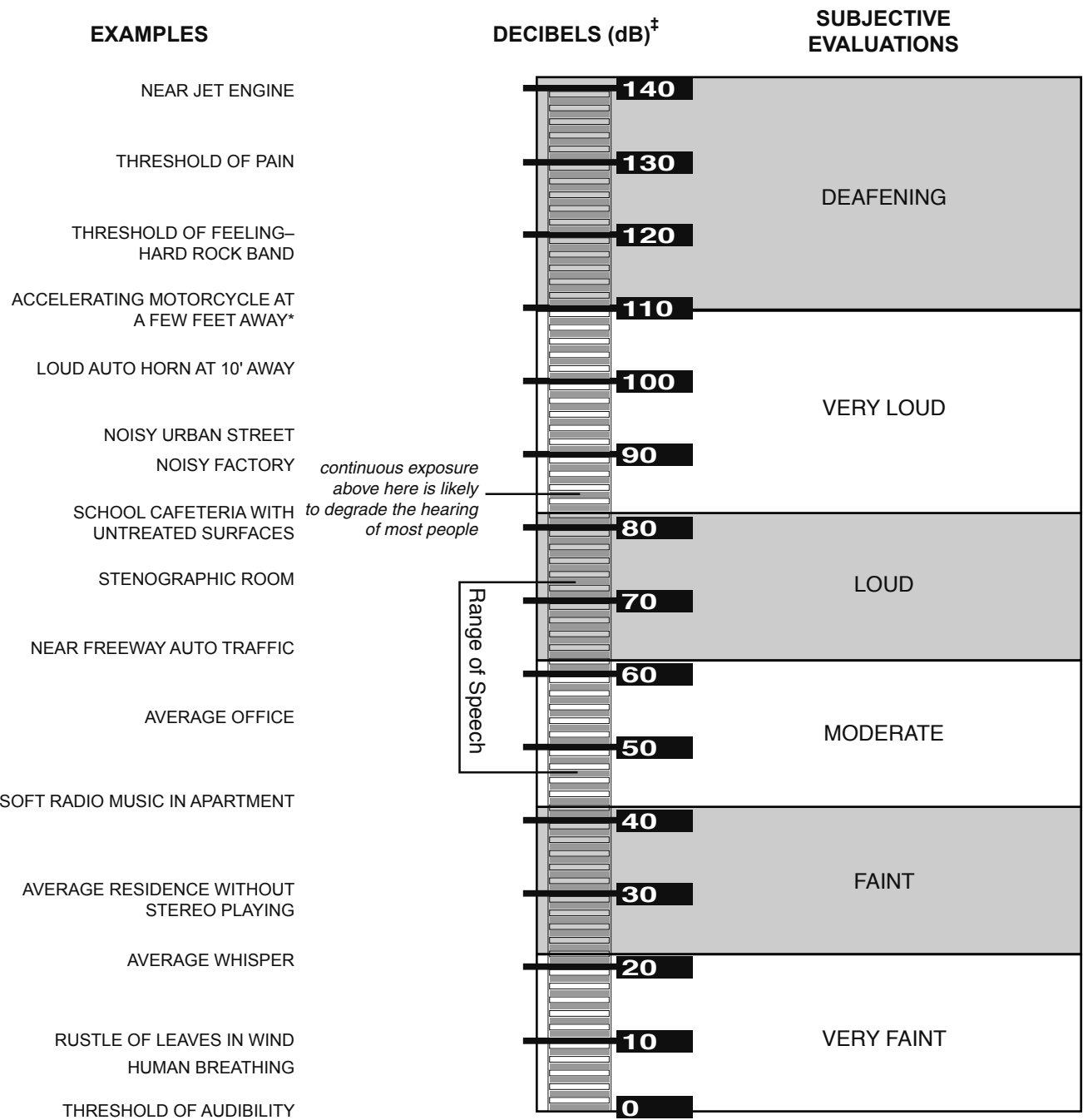
<b>Building Type</b>	<b>Open Windows</b>	<b>Closed Windows<sup>1</sup></b>
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30
Hotels/Motels	17	25

Source: Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report 117.

<sup>1</sup> As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dB(A).

When assessing community reaction to noise, there is an obvious need for a scale that averages sound pressure levels over time and quantifies the result in terms of a single numerical descriptor. Several scales have been developed that address community noise levels.

- <sup>2</sup> U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97. A “hard” or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt, concrete, and very hard packed soils. An acoustically “soft” or absorptive site is characteristic of normal earth and most ground with vegetation.
- <sup>3</sup> U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97.
- <sup>4</sup> U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Mitigation*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 18.

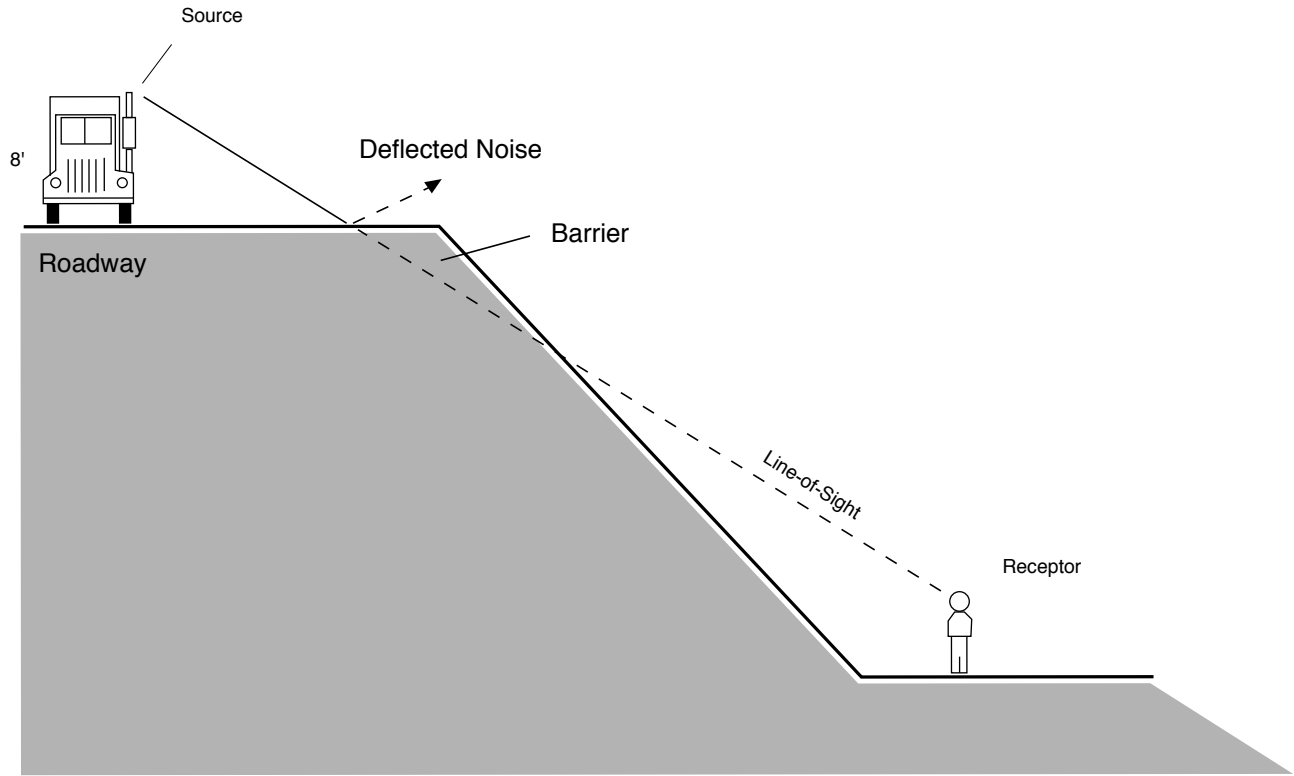


\* NOTE: 50' from motorcycle equals noise at about 2000' from a four-engine jet aircraft.

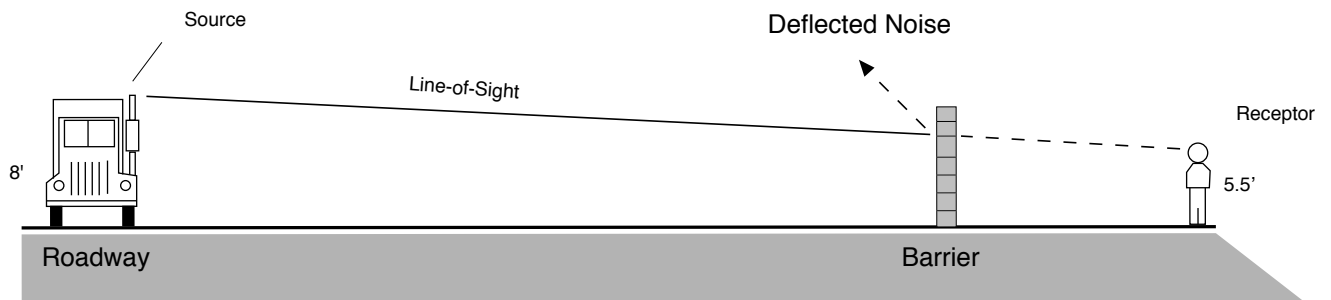
‡ NOTE: dB are "average" values as measured on the A-scale of a sound-level meter.

FIGURE 4.6-1

Common Noise Levels



"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

SOURCE: Impact Sciences, Inc. – May 2006

FIGURE 4.6-2

Noise Attenuation by Barriers

Those that are applicable to this analysis are the Equivalent Noise Level ( $L_{eq}$ ) and the Community Noise Equivalent Level (CNEL).  $L_{eq}$  is the average A-weighted sound level measured over a given time interval.  $L_{eq}$  can be measured over any period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods. 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 by adding 5 decibels to sound levels occurring during the evening from 7 PM to 10 PM, and 10 decibels to sound levels occurring during the nighttime from 10 PM to 7 AM. The 5 and 10 decibel "penalties" are applied to account for increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding these penalties to the 1-hour  $L_{eq}$  measurements typically results in a CNEL measurement that is within approximately 3 dB(A) of the peak-hour  $L_{eq}$ .<sup>5</sup>

## CHARACTERISTICS OF VIBRATION

Vibration is a unique form of noise. It is unique because its energy is carried through structures and the earth, whereas, noise is simply carried through the air. Thus, vibration is generally felt rather than heard. Some vibration effects can be caused by noise; e.g., the rattling of windows from truck pass-bys. This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Typically, groundborne vibration generated by man-made activities attenuates rapidly as distance from the source of the vibration increases. Vibration, which spreads through the ground rapidly, diminishes in amplitude with distance from the source. The ground motion caused by vibration is measured as particle velocity in inches per second and, in the U.S. is referenced as vibration decibels (VdB).

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is the typically background vibration velocity, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

**Figure 4.6-3, Typical Levels of Ground-Borne Vibration**, identifies the typical groundborne vibration levels in VdB and human response to different levels of vibration.

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<sup>5</sup> California Department of Transportation, *Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol*, (Sacramento, California: October 1998), pp. N51-N54.

## REGULATORY FRAMEWORK

### Applicable Plans and Policies

The criteria used to assess the acceptability of community noise levels vary with the municipality. The project is located within the City of Glendale; therefore, it is subject to the standards promulgated by the City.

Noise standards for specific land uses are identified in the City of Glendale's Noise Ordinance, which is located in Chapter 8.36, Section 8.36.040 of the Municipal Code. Under Section 8.36.040 of the Noise Ordinance, exterior and interior noise is regulated by reference to "presumed noise standards," which are presented below in **Table 4.6-2, Exterior Presumed Noise Standards**, and **Table 4.6-3, Interior Presumed Noise Standards**. Under Section 8.36.050 of the Noise Ordinance, where noise levels are below the presumed noise standards, the actual ambient noise level controls, and any noise more than 5 dB(A) above the actual ambient noise level is considered a violation of the Noise Ordinance. Where the actual ambient noise level exceeds the presumed noise standard, the actual ambient noise level also controls, and any noise more than 5 dB(A) above the actual ambient noise level is also considered a violation of the Noise Ordinance. However, under the Noise Ordinance, the actual ambient noise levels shall not exceed the presumed noise level by more than 5 dB(A).

**Table 4.6-2**  
**Exterior Presumed Noise Standards**

Zone	Standard	Maximum	Time
Residential (multi-family, hotels, motels and transient lodgings)	60 dB(A)	65 dB(A)	Anytime
Central Business District and Commercial	65 dB(A)	70 dB(A)	Anytime

Source: City of Glendale Municipal Code.

**Table 4.6-3**  
**Interior Presumed Noise Standards**

Zone	Decibels	Time
Residential	45 dB(A)	Nighttime <sup>1</sup>
Residential	55 dB(A)	All other times

Source: City of Glendale Municipal Code.

<sup>1</sup> Nighttime is defined as between 10:00 PM to 7:00 AM.

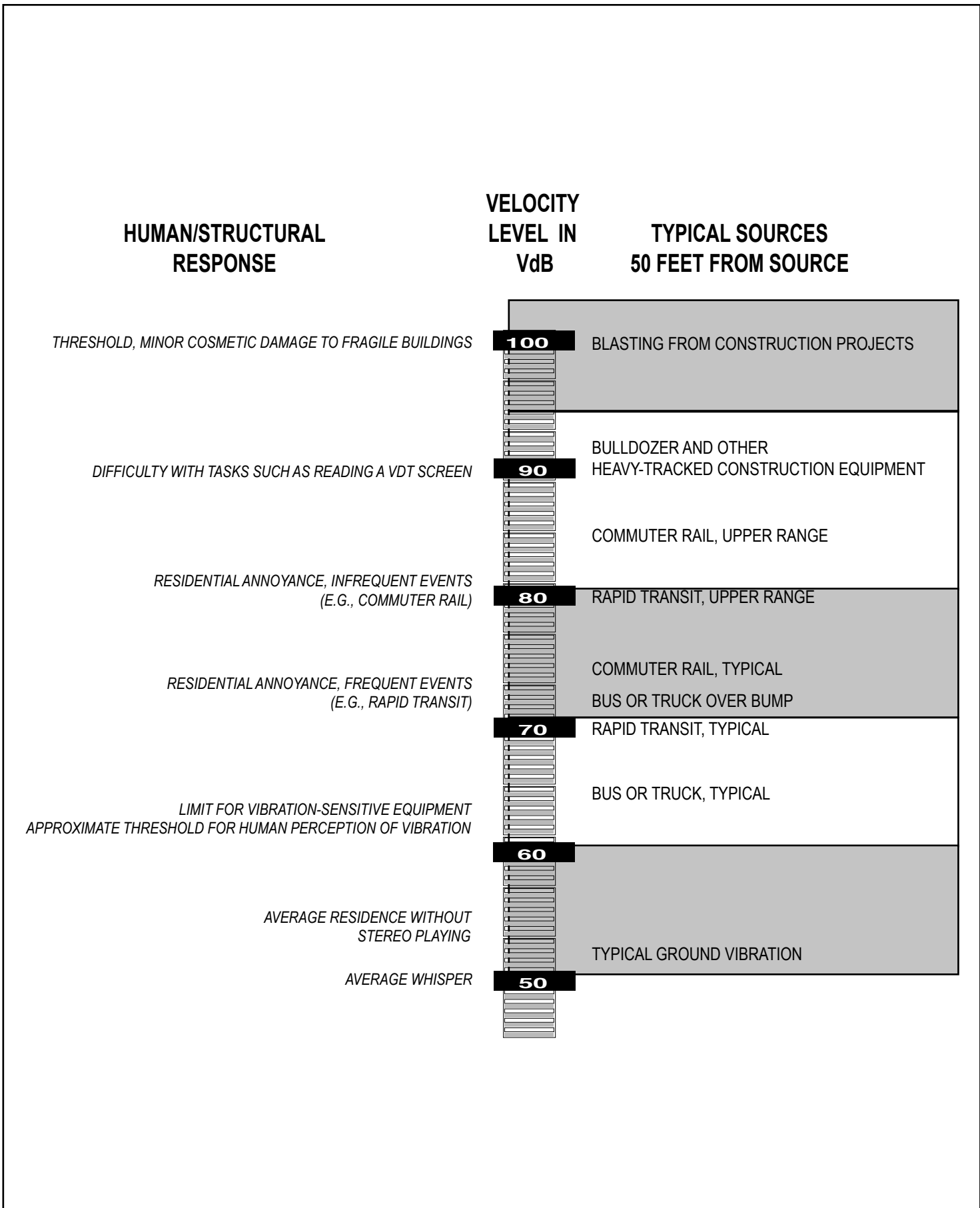


FIGURE 4.6-3

Typical Levels of Ground-Borne Vibration

In addition, the City of Glendale General Plan Noise Element (adopted June 7, 2007) establishes noise criteria for the various land uses throughout the City. **Figure 4.6-4, Land Use Compatibility to Noise**, identifies the acceptable limit of noise exposure for various land use categories within the City. Noise exposure for a residential land use is “normally acceptable” when the CNEL at exterior residential locations is equal to or below 60 dB(A), “conditionally acceptable” when the CNEL is between 60 to 70 dB(A), “normally unacceptable” when the CNEL is between 70 to 75 dB(A), and “clearly unacceptable” when the CNEL is greater than 75 dB(A). For commercial land uses, such as those proposed by the Verdugo Gardens project, a CNEL of 70 dB(A) would be considered “normally acceptable,” and a CNEL greater than 75 dB(A) would be considered “normally unacceptable.” These guidelines apply to noise sources such as vehicular traffic, aircraft, and rail movements.

Section 8.36.080 of the City of Glendale Municipal Code was adopted in order to minimize intrusive noise sources that are related to construction activities. It is unlawful for any person within a residential zone, or within 500 feet of a residential zone, to operate equipment or perform any outside construction or repair work on buildings within the City between the hours of 7:00 AM and 7:00 PM, Monday through Saturday, unless a permit is obtained beforehand. No construction is allowed on Sundays and holidays without an approved permit. The City of Glendale does not have regulations that establish maximum construction noise levels. However, Section 8.36.290(K) provides an exemption from the Noise Ordinance for any activity, operation, or noise, which cannot be brought into compliance (with the Noise Ordinance) because it is technically infeasible to do so. “Technical infeasibility” for the purpose of this section means that noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers and/or any other noise reduction devices or techniques during the operation of the equipment.

Section 8.36.210 of the Noise Ordinance provides that vibration created by the operation of any device would be a violation of City standards if such vibration were above the vibration perception threshold of an individual at or beyond the property boundary of a source on private property. For sources on a public space or public right-of-way, a violation would occur if the vibration perception threshold of an individual were exceeded at a distance of 150 feet from the source. The Noise Ordinance does not define the level of vibration that is deemed perceptible by an individual and does not establish maximum allowable vibration levels.

## ENVIRONMENTAL SETTING

### Existing Conditions

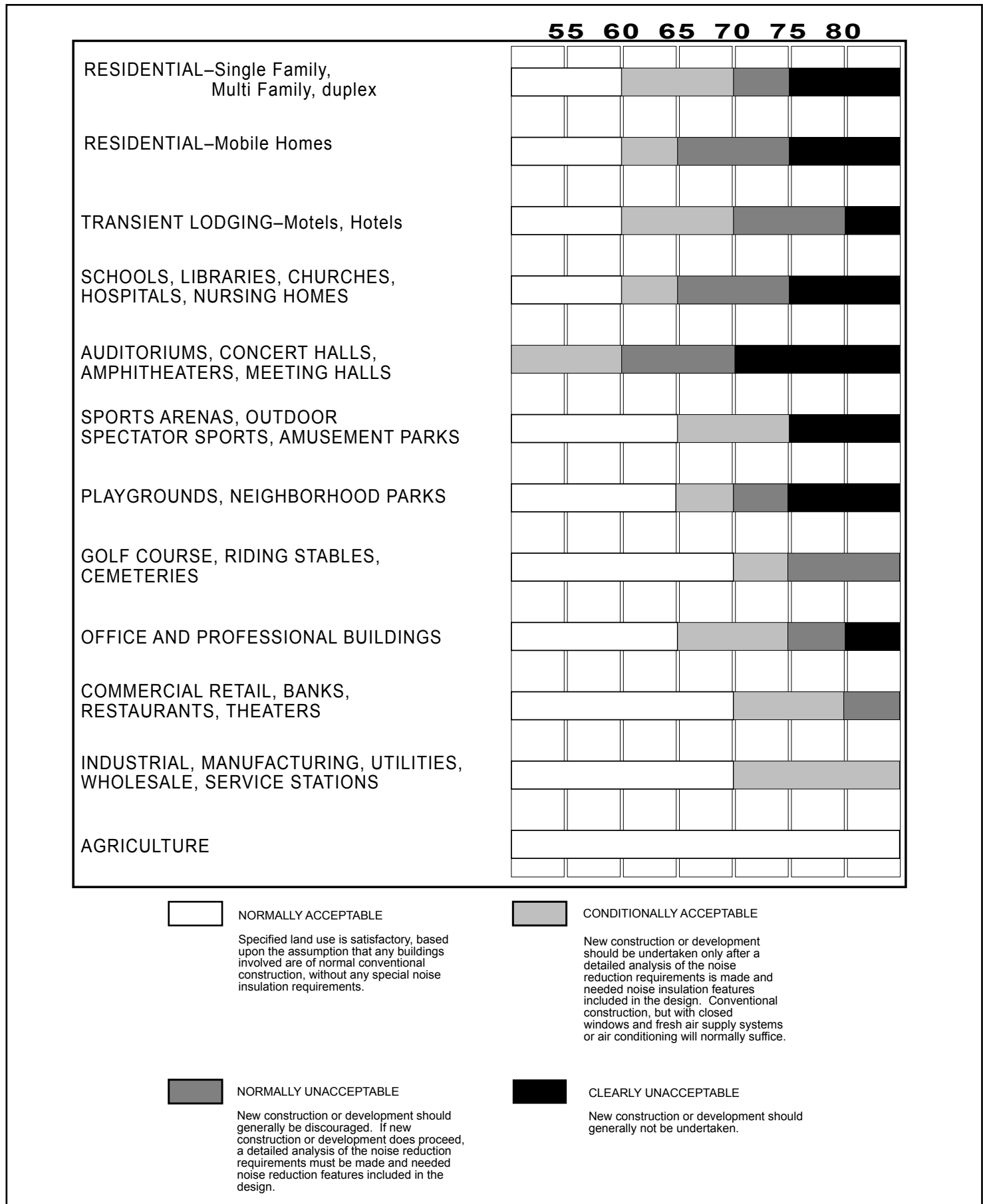
#### *Noise Environment*

Land uses surrounding the project site consist of commercial and office uses. No noise sensitive receptors exist within the immediate vicinity of the site.

The project site is located in an urban location in the City of Glendale and is exposed to noise sources typical of such a setting. Stationary sources of noise on the site include commercial and office uses and parking (e.g., doors slamming, car alarms). Off-site stationary noise sources in the area that are audible on the site include activities associated with commercial and retail uses surrounding the site, such as people talking, doors slamming and tires squealing, and truck deliveries. Mobile sources of noise that are audible on the site are related to traffic along Central Avenue, Brand Boulevard, Sanchez Drive, and SR-134.

#### **Existing Ambient Monitored Noise Levels**

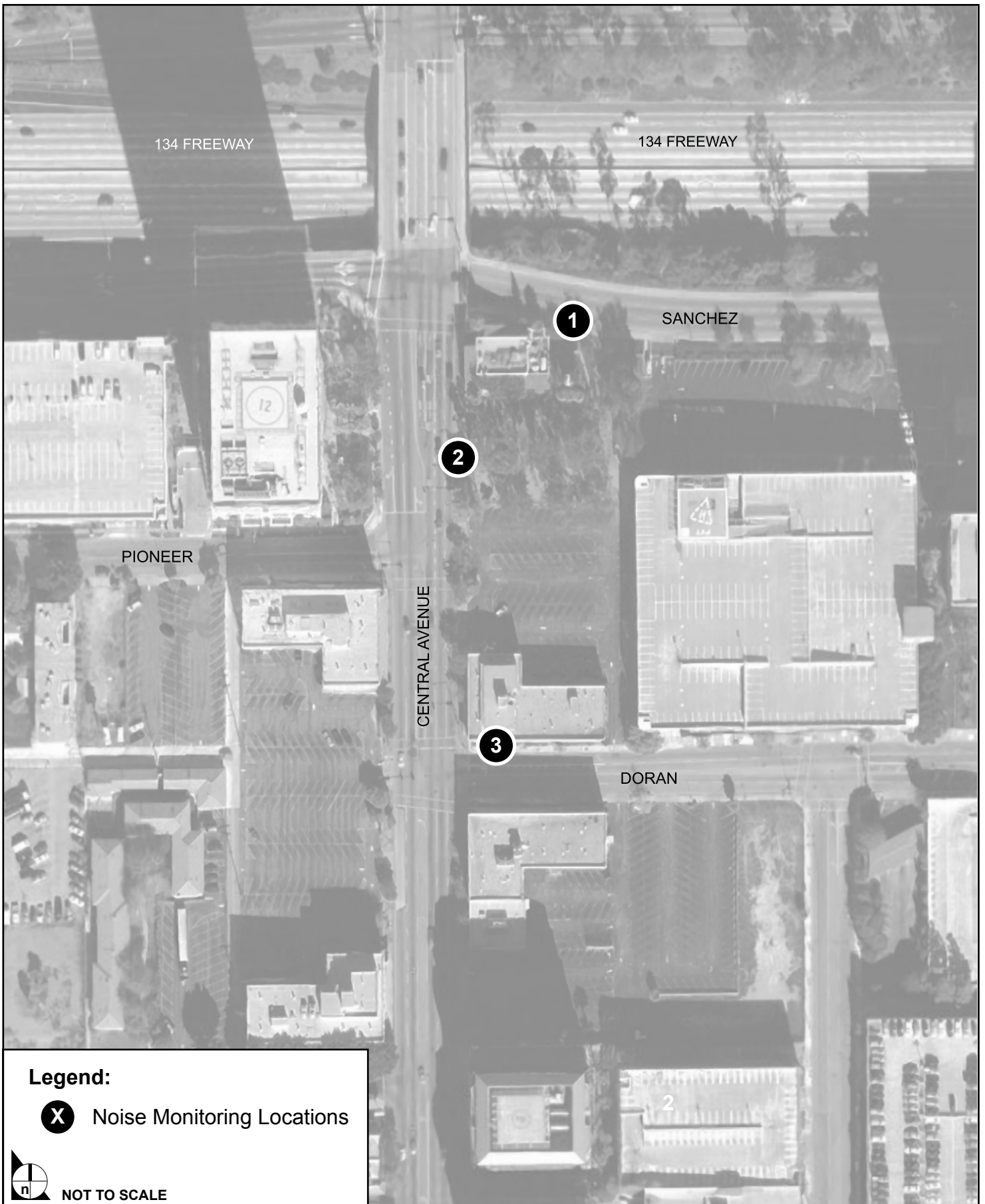
Impact Sciences, Inc. conducted noise level monitoring to document ambient conditions, using a Larson Davis Model 720 Sound Level Meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Noise monitoring was conducted at three locations around the project site on Thursday, May 4, Tuesday, May 9, and Tuesday, May 16, 2006, for 24-hour periods. These noise levels are conservative since they were not measured during the weekend. Noise readings were taken in  $L_{eq}$  20-minute periods with "A" frequency fast time weighting. No unique or special events, such as high-winds or construction activities, were noted during the monitoring periods. **Figure 4.6-5, Noise Monitoring Location**, illustrates the location of noise monitoring sites, and **Table 4.6-4, Existing Ambient Monitored Noise Levels**, provides the data associated with each monitoring period for each location. As shown, noise levels ranged from 69 dB(A) to 75 dB(A) CNEL adjacent to the project site. These monitored levels are typical of commercial, office, dining, and entertainment land uses.



SOURCE: City of Glendale Noise Element

FIGURE 4.6-4

Land Use Compatibility to Noise



SOURCE: Google Earth – 2006, Impact Sciences, Inc. – May 2006

FIGURE 4.6-5

Noise Monitoring Locations

**Table 4.6-4  
Existing Ambient Monitored Noise Levels**

Location	Noise Sources	Noise Levels
Location No. 1 – On project site along Sanchez and Highway 134 approximately 20 feet from edge of Sanchez	Vehicles, Restaurant Patrons	75 dB(A)
Location No. 2 – On project site along Central Avenue approximately 20 feet from roadway edge.	Vehicles, Restaurant Patrons	72 dB(A)
Location No. 3 – On project site along Doran Avenue approximately 20 feet from roadway edge.	Vehicles, Restaurant and Commercial Use Patrons	69 dB(A)

Source: Impact Sciences, Inc., May 4, 9, and 16, 2006.

### Existing Modeled Noise Levels

The existing ambient noise environment for the roadways was determined by calculating noise levels based on average daily trips determined in the traffic analysis conducted for this EIR. The noise modeling effort was accomplished using the modified version of the Federal Highway Administration Highway Noise Prediction Model. The results of the noise modeling are provided in **Table 4.6-5, Existing Roadway Modeled Noise Levels**. As shown, roadway noise levels range from a low of 59.5 to a high of 77.2 dB(A) CNEL.

**Table 4.6-5  
Existing Roadway Modeled Noise Levels**

Roadway Segment	CNEL in dB(A) at 50 Feet from Roadway Centerline
Central Avenue north of Goode Avenue	66.6
Central Avenue north of Sanchez Drive	67.4
Central Avenue north of Pioneer Drive	68.1
Central Avenue north of Doran Street	67.8
Central Avenue south of Doran Street	67.5
Brand Boulevard north of Goode Avenue	64.3
Brand Boulevard north of Sanchez Avenue	65.5
Brand Boulevard north of Doran Street	65.5
Brand Boulevard south of Doran Street	64.4
Orange Street south of Doran Street	59.5
Goode Avenue west of Brand Boulevard	60.7
Sanchez Drive east of Central Avenue	60.3
Doran Street west of Orange Street	60.0
Doran Street west of Brand Boulevard	61.7
Doran Street east of Brand Boulevard	61.0
Highway 134 west Pacific Avenue*	77.2

\* Noise level is estimated on project site from Highway 134 centerline

Source: Impact Sciences, Inc. Model results are contained in **Appendix 4.6**.

Based on noise monitoring and noise modeling conducted, the existing noise levels around the project site exceed City threshold levels for residential land uses.

## ENVIRONMENTAL IMPACTS

### Methodology

Analysis of the existing and future noise environments presented in this EIR section is based on technical reports, noise monitoring, and noise prediction modeling. Predicted vibration impacts resulting from the implementation of the proposed project were determined using data from the Federal Transit Administration. Noise modeling procedures involved the calculation of existing and future vehicular noise levels along individual roadway segments. This was accomplished using the Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108). This model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site conditions. Average vehicle noise rates (energy rates) utilized in the Federal Highway Administration Highway Model have been modified to reflect average vehicle noise rates identified for the State of California by the California Department of Transportation (Caltrans). Caltrans data shows that California automobile noise is 0.8 to 1.0 dB(A) louder than national levels and that medium and heavy-duty truck noise is 0.3 to 3 dB(A) quieter than national levels. Traffic volumes utilized as data inputs to the noise prediction model were calculated based on information provided by Linscott, Law & Greenspan, the project traffic engineer, and are consistent with the analysis provided in **Section 4.4, Traffic, Circulation, and Parking**, of this EIR.

### Thresholds of Significance

The following thresholds for determining the significance of impacts related to noise are contained in the environmental checklist form contained in Appendix G of the most recent update of the *California Environmental Quality Act (CEQA) Guidelines*. The *CEQA Guidelines* ask whether the project would result in:

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

- For a project located within an airport land use plan or, where such plan has not been adopted, within 2 miles of a public airport or public use airport, would expose people residing or working in the project area to excessive noise levels (issue is addressed in **Appendix 1.0(a), Notice of Preparation**).
- For a project within the vicinity of a private airstrip would the project expose people residing or working in the project area to excessive noise levels (issue is addressed in **Appendix 1.0(a), Notice of Preparation**).

The *CEQA Guidelines* do not provide a definition for “substantial increase” in noise and they do not provide a threshold of significance for potential noise or vibration impacts. Therefore, the following thresholds of significance were developed for this noise analysis based upon the General Plan Noise Element and Noise Ordinance discussed previously in this EIR section. These thresholds apply to both project impacts and cumulative impacts.

## *Noise*

### **On-Site Noise Thresholds**

As shown in **Figure 4.6-4**, retail, restaurants, banks, and theaters are “normally acceptable” with exterior noise levels of up to 70 dB(A) CNEL. Based on this information, and for purposes of this EIR, the project would result in a significant noise impact if on-site exterior locations around the commercial and retail uses would be exposed to noise levels above 70 dB(A) CNEL. For residential uses and hotels, the guidelines for noise identify 65 dB(A) CNEL as the “normally acceptable” exterior noise level threshold. A standard of 65 dB(A) for multi-family residential use is also consistent with the City’s Noise Ordinance, which establishes that ambient noise levels should not exceed the “presumed noise standard” of 60 dB(A) by more than 5 dB(A). Therefore, the project would result in a significant noise impact if a person residing within the proposed residential uses would be exposed to exterior noise above 65 dB(A).

Interior noise levels for residential uses are 45 dB(A) during the nighttime and 50 dB(A) during the daytime. The City Noise Ordinance and Noise Element do not provide noise level standards for the interior of commercial-retail uses.

### **Off-Site Noise Thresholds**

Off-site noise thresholds consider the following: the City’s Noise Compatibility Criteria, community responses to changes in noise levels, and CEQA standards. As stated earlier, changes in a noise level of less than 3 dB(A) are not typically noticed by the human ear. Some individuals who are extremely

sensitive to changes in noise may notice changes from 3 to 5 dB(A). Based on this information, the following thresholds have been established for this analysis:

- An increase of 3 dB(A) or greater in traffic noise level that occurs due to project-related activities would be significant if the resulting noise levels would cause the City's noise compatibility thresholds for "normally acceptable" exterior or interior noise levels to be exceeded, or result in a 3 dB(A) increase in noise to a land use experiencing levels above the City's noise compatibility threshold for "normally acceptable." A noise level increase of less than 3 dB(A) under either of the previously described scenarios is not considered to be significant.
- An increase of 5 dB(A) or less in traffic noise level that occurs from project-related activities would be considered not significant if the resulting noise levels remain below the "acceptable" thresholds established by the City. Increases in traffic noise greater than 5 dB(A) would be considered to be significant even if the resulting noise levels are below City standards.
- Stationary noise sources proposed as part of the project that could result in increases in noise levels at adjacent land uses that exceed City standards would be considered significant.

## ***Vibration***

### **Vibration Thresholds**

The City's Municipal Code states that a violation of City standards would occur if the operation of a device creates a vibration above the vibration perception threshold. A numerical threshold to identify the point at which a vibration impact is deemed perceptible is not identified in the City's Municipal Code. In the absence of significance thresholds for vibration from construction, the Federal Railroad Administration (FRA) identifies a maximum acceptable level threshold of 65 VdB for buildings where low ambient vibration is essential for interior operations (such as hospitals and recording studios), 72 VdB for residences and buildings where people normally sleep, and 75 VdB for institutional land uses with primary daytime use (such as churches and schools).

### **Impact Analysis**

Each applicable threshold of significance is listed below followed by analysis of the significance of any potential impacts and the identification of mitigation measures that would lessen or avoid potential impacts. Finally, the significance of potential impacts after implementation of all identified mitigation measures is presented.

**Thresholds:** *Would result in the 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.*

*Would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.*

As stated previously, based on noise monitoring and noise modeling conducted, the existing ambient noise level around the project site already exceeds City threshold exterior noise levels for residential land uses.

***Impact Analysis:***

Vehicle Noise – Vehicular noise can potentially affect the project site, as well as land uses located along the studied roadway system. Based on the distribution of traffic volumes, noise modeling was conducted for the roadways analyzed in **Section 4.4, Traffic, Circulation and Parking**. Specifically, forecasts were calculated by comparing the existing noise to existing plus project. The results of the modeled weekday roadway noise levels are provided below in **Table 4.6-6, Operational Roadway Noise Levels**. Changes in CNEL levels resulting from the proposed project will range from 0.0 dB(A) to 0.1 dB(A). None of the roadway segments would result in an increase in CNEL of greater than 3 dB(A) during the weekday resulting from the project's development. As discussed above, the 3 dB(A) threshold represents the point at which only the most sensitive individuals notice a change in noise levels. Potential impacts are, therefore, considered to be less than significant.

As shown in **Table 4.6-6**, existing plus project modeled noise levels on the project site along Central Avenue north of Pioneer Drive would be approximately 68.1 dB(A) CNEL and along Highway 134 east of Pacific Avenue north of Doran Street, and 77.2 dB(A) CNE. These noise levels are consistent with the monitored results around the project site of between 69 dB(A) to 75 dB(A) CNEL. In both cases, noise levels would be above the City Municipal Code exterior noise threshold of 65 dB(A) for residential uses, and if the project were to develop exterior living areas along Central Avenue and Highway 134, such as patios or exterior useable areas, impacts would be significant. In addition, interior noise levels in the building along these roadways could be above the interior threshold of 55 dB(A) during the daytime and 45 dB(A) during the nighttime resulting in significant interior noise level as well.

**Table 4.6-6  
Operational Roadway Noise Levels**

<b>Roadway Segment</b>	<b>Existing Noise Levels Without Project</b>	<b>Existing Noise Levels Plus Project</b>	<b>Change in Noise Levels</b>	<b>Significant Project Impact</b>
Central Avenue north of Goode Avenue	66.6	66.6	0.0	NO
Central Avenue north of Sanchez Drive	67.4	67.4	0.0	NO
Central Avenue north of Pioneer Drive	68.1	68.2	0.1	NO
Central Avenue north of Doran Street	67.8	67.8	0.0	NO
Central Avenue south of Doran Street	67.5	67.5	0.0	NO
Brand Boulevard north of Goode Avenue	64.3	64.3	0.0	NO
Brand Boulevard north of Sanchez Avenue	65.5	65.5	0.0	NO
Brand Boulevard north of Doran Street	65.5	65.5	0.0	NO
Brand Boulevard south of Doran Street	64.3	64.3	0.0	NO
Orange Street south of Doran Street	59.5	59.5	0.0	NO
Goode Avenue west of Brand Boulevard	60.7	60.7	0.0	NO
Sanchez Drive east of Central Avenue	60.3	60.3	0.0	NO
Doran Street west of Orange Street	59.9	60.0	0.1	NO
Doran Street west of Brand Boulevard	61.7	61.7	0.0	NO
Doran Street east of Brand Boulevard	61.0	61.0	0.0	NO
Highway 134 east of Pacific Avenue*	77.2	77.2	0.0	NO

\* Noise level is estimated on project site from Highway 134 centerline

All values are listed in dB(A)

Source: Impact Sciences, Inc. Model results are contained in **Appendix 4.6**.

**Level of Significance Before Mitigation:** Significant.

**Mitigation Measures:** The following mitigation measure is provided to reduce interior noise level to acceptable levels:

- 4.6-1 Noise sensitive residential land uses proposed in areas exceeding the exterior 65 dB(A) CNEL (such as those dwelling units facing Central Avenue and Highway 134) shall be designed so that interior noise levels attributable to exterior sources do not exceed 55 dB(A) during the daytime and 45 dB(A) during the nighttime when doors and windows are closed. An acoustical analysis of the noise insulation effectiveness of proposed construction shall be required and documented during permit review, showing that the building materials and construction specifications are

adequate to meet the interior noise standard. Examples of building materials and construction specifications which may be used to meet the interior noise standard include the following:

- North-facing windows and sliding glass doors along Highway 134 shall be doubled paned, mounted in low air filtration rate frames, and have a sound transmission coefficient rating of 30 or greater;
- Air conditioning units may be provided to allow for windows to remain closed; and
- Roof or attic vents facing northward shall be baffled.

*Level of Significance After Mitigation:* Significant and unavoidable (exterior), Less than significant (interior).

Parking Structures – Development of the proposed project would introduce a six-level parking garage on the project site. Two of the parking levels are proposed below grade, with the remaining four levels of parking included on the ground and upper floors of the building. Subterranean parking levels would not be a source of noise due to being fully enclosed. In general, noise associated with parking structures is not of sufficient volume to exceed community standards based on the time-weighted CNEL scale. Parking structures can be a source of annoyance due to automobile engine start-ups and acceleration, and the activation of car alarms. On-site residential land uses would be the closest sensitive receptors within the project area and would thus represent the worst-case impact associated with parking structure noise from the project. Parking structures can generate  $L_{eq}$  noise levels of between 49 dB(A)  $L_{eq}$  (tire squeals) to 74 dB(A)  $L_{eq}$  (car alarms) at 50 feet. Due to the high level of traffic noise along streets surrounding the project site, normal daytime parking structure  $L_{eq}$  noise would not likely be audible due to the masking of noise by traffic on nearby roadways. However, single noise events could be an annoyance to site residents and may exceed the 65 dB(A) Municipal Code threshold at receptor locations.

*Level of Significance Before Mitigation:* Significant.

***Mitigation Measures:***

4.6-2 Sound attenuation measures shall be incorporated into the design to minimize noise leakage from the aboveground parking structure. These measures may include a half-wall on the grade-level parking deck, full walls on the sides of the structure that face nearby receptors, and/or noise control louvers on selected structure facades that potentially influence receptor areas. Acoustical analysis shall be performed to demonstrate that the aboveground parking structure does not result in noise levels that exceed City standards at on-site residences. These components shall be

incorporated into the plans to be submitted by the applicant to the City of Glendale for review and approval prior to the issuance of building permits.

***Level of Significance After Mitigation:*** Less than significant.

Street Sweepers – Other noise sources that may be associated with the parking structure areas include the use of sweepers in the early morning or late evening hours. Noise levels generated by sweepers are generally higher than parking lot noise associated with automobile activities. Sweepers can generate noise levels of 68 dB(A)  $L_{eq}$  at 50 feet for normal sweeping activities.<sup>6</sup> The noise from sweepers would not cause an increase in long-term noise of more than 3 dB(A) over the time-weighted CNEL, and would not be significant from that perspective. However, the peak sound levels generated by the sweepers could exceed the single noise event threshold for on-site residences. Depending on the timing of operations, this noise source would result in significant noise impacts during quieter morning and evening periods, and would exceed the Municipal Code 65 dB(A) threshold for exterior uses at receptor locations.

***Level of Significance Before Mitigation:*** Significant.

***Mitigation Measures:***

4.6-3 On-site sweeper operations shall be restricted to the hours of 7:00 AM to 10:00 PM.

In addition to this mitigation measure, the implementation of design features associated with the parking structure would reduce noise impacts associated with sweepers.

***Level of Significance After Mitigation:*** Less than significant.

On-Site Retail Uses – Future residents within the project site may experience noise due to human activity within the area from patrons using commercial/retail businesses and the public open and park space proposed on site. Potential noise sources associated with retail uses on site include people talking, music from dining uses, and other noise associated with commercial activity. Roadway noise would be a more prominent noise source and, therefore, noise generated by human activity would not result in a significant impact.

***Level of Significance Before Mitigation:*** Less than significant.

***Mitigation Measures:*** None are required.

***Level of Significance After Mitigation:*** Less than significant.

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<sup>6</sup> Keating, Janice, *Street Sweepers Picking Up Speed and Quieting Down*, The Journal for Surface Water Quality.

Residential On-Site Development – Future residents located on the project site, as well as off-site uses, may experience noise due to an increase in human activity within the area. Potential residential-type noise sources include people talking, doors slamming, stereos, domestic animals, and other noises associated with human activity. These noise sources are not unique and generally contribute to the ambient noise levels experienced in all residential areas. Noise levels for residential areas are typically between 48 to 52 dB(A) CNEL.<sup>7</sup> Overall, the noise generated by the project's residential land uses would not exceed the City's compatibility thresholds and is considered to be less than significant.

*Level of Significance Before Mitigation:* Less than significant.

*Mitigation Measures:* None are required.

*Level of Significance After Mitigation:* Less than significant.

**Threshold:** *Would result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.*

*Impact Analysis:* Ground vibrations from construction activities very rarely reach the levels that can damage structures, but they can achieve the audible range and be felt in buildings very close to the site. The primary and most intensive vibration source associated with the development of the project would be the use of bulldozers and pile drivers during construction. These types of equipment can create intense noise that is disturbing and can result in ground vibrations.

The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Ground vibrations from construction activities rarely reach the levels that can damage structures, but they can achieve the audible and perceptible ranges in buildings close to the construction site. **Table 4.6-7, Vibration Source Levels for Construction Equipment**, lists vibration source levels for construction equipment.

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<sup>7</sup> U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

**Table 4.6-7  
Vibration Source Levels for Construction Equipment**

Equipment	Approximate VdB			
	25 Feet	50 Feet	75 Feet	100 Feet
Pile Driver (vibratory)	93	87	83	81
Large Bulldozer	87	81	77	75
Loaded trucks	86	80	76	74
Jackhammer	79	73	69	67
Small Bulldozer	58	52	48	46

Source: Federal Railroad Administration, 2005.

As indicated in **Table 4.6-7**, pile drivers and large bulldozers are capable of producing approximately 83 and 77 VdB, respectively, at 75 feet, the approximate distance to the nearest structure. Land uses surrounding the project site consist of commercial and office uses, and do not contain sensitive equipment, are not location where person sleep, and are considered institutional uses. Consequently, the project would not result in the exceedance of any of the identified thresholds. Vibration impacts are considered less than significant.

**Level of Significance Before Mitigation:** Less than significant.

**Mitigation Measures:** None are required.

**Level of Significance After Mitigation:** Less than significant.

**Threshold:** *Would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

**Impact Analysis:** The construction period for the project is anticipated to consist of four phases and last approximately 26 months. Initially, the project would involve the removal all asbestos-containing building materials (ACBM), lead paint, and light ballast containing polychlorinated biphenyls (PCBs) from the site, in accordance with applicable local, state, and federal regulations. It is anticipated that equipment needs would be minimal with enclosed or covered haul trucks carrying bagged or non-regulated materials and haul trucks. The removal of these materials would occur concurrently with Phase I.

Phase I (Demolition) would involve the demolition and removal of the existing on-site structures. Demolition and removal on a worst-case day would involve the use of standard construction equipment, including three loaders, and one backhoe with a pneumatic hammer. In addition, this phase would

include up to 20 demolition haul truck round trips per day. This phase is anticipated to take one month to complete.

Phase II (Site Grading) would involve the excavation of existing fill materials and replacement with properly compacted fill materials. Activities on a worst-case day would involve the use of one auger, three loaders, one hydraulic crane, and one water truck, which would be stored on site during construction to minimize disruption of the surrounding land uses. In addition, this phase would involve approximately 16 truck/trailer combos per day for export and import of soil. This phase is anticipated to take two months to complete.

Phase III would consist of sub-grade construction, and Phase IV would involve above-grade construction (Phase III and IV constitute Building Construction). Activities during this phase on a worst-case day would involve the use of standard construction equipment, including one crane, four forklifts, one concrete pump, skill saws, power drills, truck-mounted welding rigs, and two electric lifts. In addition, during the peak period, these phases are anticipated generate a total of 10 to 20 material delivery trucks per day along with a total of 20 to 40 concrete trucks per day. This phase is anticipated to take approximately 18 to 23 months to complete.

Equipment used during the construction phases would generate both steady-state and episodic noise that would be heard both on and off the project site. Noise levels generated during construction would primarily affect the patrons of the commercial and offices uses adjacent to the project site. The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. This data is presented in **Figure 4.6-6, 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 95 dB(A) when measured at 50 feet.

Construction activities associated with the project would occur at approximately 75 feet from existing commercial and office uses. Noise levels generated during each of the project phase are presented in **Table 4.6-8, Estimated Noise Levels for Construction Phases**. Equipment estimates used for the analysis for demolition, grading, and building construction noise levels are representative of worse case conditions, since it very unlikely that all the equipment contained on site would operate simultaneously. As presented, potential construction-related noise impacts are considered significant due to exceeding the noise threshold of 65 dB(A) for central business district, as allowed by the Municipal Code.

**Table 4.6-8  
Estimated Noise Levels for Construction Phases**

Construction Phase	Approximate Leq (dB(A)) without Noise Attenuation			
	75 Feet	100 Feet	200 Feet	300 Feet
Demolition	87	84	78	75
Site Grading	88	85	79	75
Building Construction	92	89	83	79

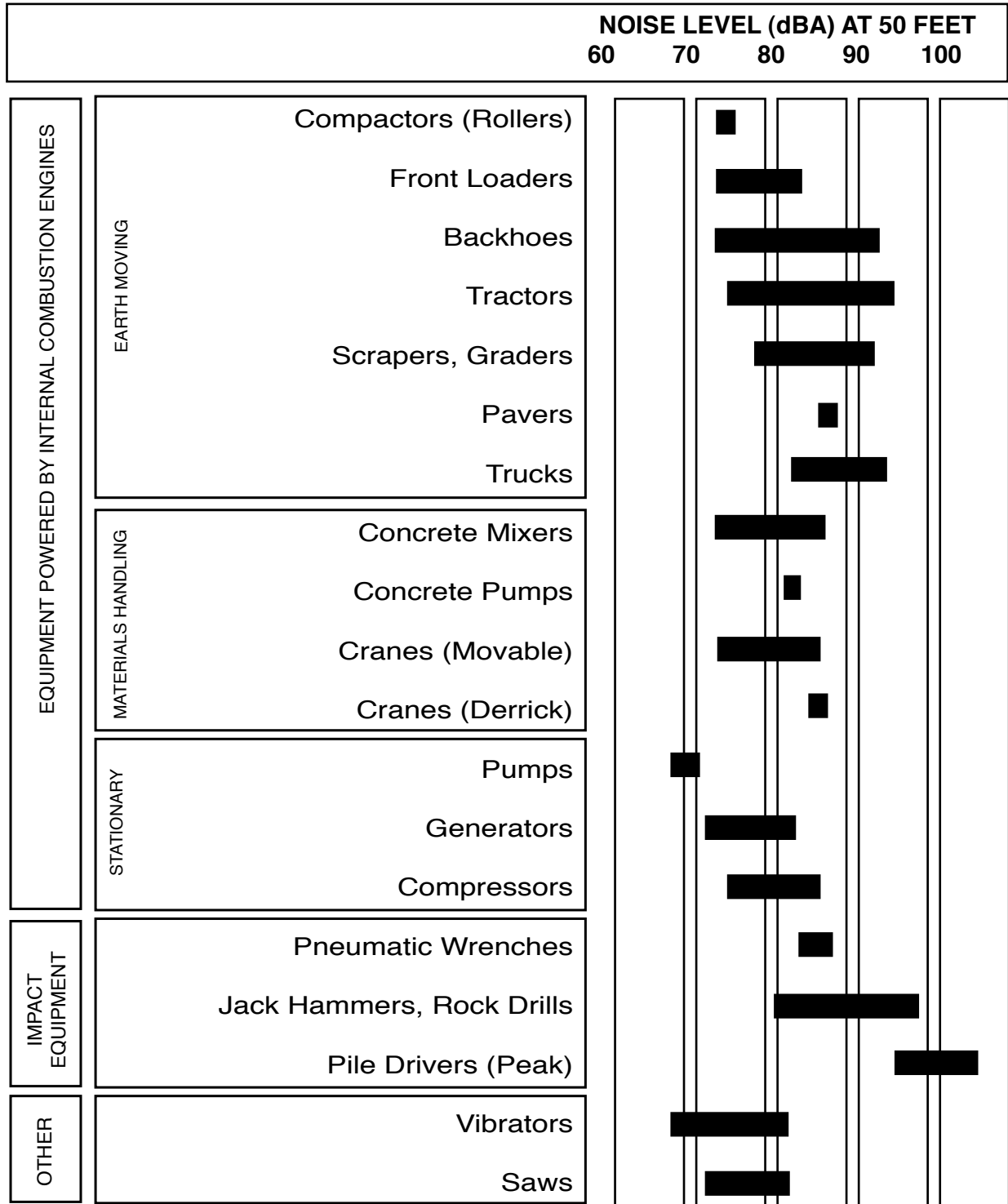
Source: Model results are contained in Appendix 4.6.

Besides equipment noise associated with construction activities, construction traffic would generate noise along access routes to the proposed development areas. The major pieces of heavy equipment would be moved onto the development only one time for each construction activity (i.e., demolition, grading, etc). In addition, daily transportation of construction workers and the hauling of materials both on and off the project site are expected to cause increases in noise levels along project roadways, although noise levels from such trips would be less than peak hour noise levels generated by project trips during project operation. Given that it takes a doubling of average daily trips on roadways to increase noise by 3 dB(A) and that average daily trips from construction activities would not result in a doubling of trip volume, the noise level increases along major arterials in the City of Glendale would be less than 3 dB(A), and potential impacts would be less than significant.

**Level of Significance Before Mitigation:** Significant.

Mitigation Measures: The following mitigation measures are provided to reduce noise levels associated with construction:

- 4.6-4 All construction activity within the City shall be conducted in accordance with Section 8.36.080 of the City of Glendale Municipal Code.
- 4.6-5 The project applicant shall require by contract specifications that the following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels:
- Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses within 1,000 feet of a project site disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period;
  - Ensure that construction equipment is properly muffled according to industry standards and be in good working condition;
  - Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible;



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 4.6-6

## Noise Levels of Typical Construction Equipment

- Schedule high noise-producing activities between the hours of 8:00 AM and 5:00 PM to minimize disruption on sensitive uses;
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources;
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible;
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 30 minutes; and
- Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective action, and report the action taken to the reporting party. Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

4.6-6 The project applicant shall require by contract specifications that construction staging areas along with the operation of earthmoving equipment within the project area be located as far away from vibration- and noise-sensitive sites as possible. Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

4.6-7 The project applicant shall require by contract specifications that heavily loaded trucks used during construction would be routed away from residential streets to the extent feasible. Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

*Level of Significance After Mitigation:* Significant and unavoidable.

## Cumulative Impacts

For purposes of this analysis, development of the related projects provided in **Table 4.0-1, Related Projects**, in **Section 4.0, Environmental Impact Analysis**, will be considered to contribute to cumulative noise impacts. Noise by definition is a localized phenomenon, and drastically reduces as distance from the source increases. Consequently, only projects and growth due to occur in the general area of the project site would contribute to cumulative noise impacts.

**Thresholds:** *Would result in the 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.*

*Would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.*

**Impact Analysis:** Cumulative development would be subject to California Noise Insulation and City of Glendale standards, which require that new hotels, apartment houses, and dwellings achieve an interior noise level of 45 dB(A), and that commercial and office uses achieve interior noise levels of 55 dB(A). Nonetheless, it cannot be guaranteed that all cumulative development associated with related projects would or could comply with these standards, which could result in the exposure of persons to noise levels in excess of applicable standards. Thus, the cumulative impact could be significant. The project impacts would be less than significant, as all residential and commercial development under the project would be designed to comply with these standards, and as noted above, would achieve compliance. Consequently, the project contribution to noise impacts is not considered to be cumulatively considerable.

Cumulative development from related projects would not result in a cumulative impact in terms of a substantial permanent increase in ambient noise levels. A substantial permanent increase is most likely to originate from an increase in noise levels due to roadway traffic. For the purposes of this EIR, an increase of 5 dB(A) at any roadway location is considered a significant impact, and if the resulting noise level would exceed the land use compatibility criteria, then an increase of 3 dB(A) is considered significant. In order to determine whether the project would result in a cumulatively significant impact, the increase between existing conditions and future with the project conditions was determined. Refer to **Table 4.6-9, Cumulative Roadway Noise Levels**. As shown, no increase above 1.0 dB(A) CNEL is anticipated. Consequently, there would be no cumulatively significant impact with regard to roadway noise. In addition, because the contribution of the project was included in the future with project conditions, the project's impact is also less than significant.

**Table 4.6-9  
Cumulative Roadway Noise Levels**

Roadway Segment	Existing	Future Noise Levels With Project	Cumulative Change in Noise Levels	Cumulative Project Impact
Central Avenue north of Goode Avenue	66.6	67.5	0.9	NO
Central Avenue north of Sanchez Drive	67.4	68.1	0.7	NO
Central Avenue north of Pioneer Drive	68.1	68.8	0.7	NO
Central Avenue north of Doran Street	67.8	68.5	0.7	NO
Central Avenue south of Doran Street	67.5	68.2	0.7	NO
Brand Boulevard north of Goode Avenue	64.3	64.7	0.4	NO
Brand Boulevard north of Sanchez Avenue	65.5	66.5	1.0	NO
Brand Boulevard north of Doran Street	65.5	66.1	0.6	NO
Brand Boulevard south of Doran Street	64.3	65.0	0.7	NO
Orange Street south of Doran Street	59.5	59.9	0.4	NO
Goode Avenue west of Brand Boulevard	60.7	61.0	0.3	NO
Sanchez Drive east of Central Avenue	60.3	60.7	0.4	NO
Doran Street west of Orange Street	59.9	60.2	0.3	NO
Doran Street west of Brand Boulevard	61.7	62.1	0.4	NO
Doran Street east of Brand Boulevard	61.0	61.2	0.2	NO
Highway 134 east of Pacific Avenue	77.2	77.3	0.1	NO

Source: Impact Sciences, Inc. Model results are contained in *Appendix 4.6*.

With regard to stationary sources, there could be a cumulatively significant impact resulting from cumulative development. The major stationary sources of noise that would be introduced in the area by related projects would include rooftop equipment, loading docks, and parking structures. Since these projects would be required to adhere to City of Glendale noise standards, all the stationary sources would be required to provide shielding or other noise abatement measures so as not to cause a substantial increase in ambient noise levels. Moreover, due to distance, it is unlikely that noise from multiple related projects would interact to create a significant combined noise impact. Therefore, it is not anticipated that a significant cumulative increase in permanent ambient noise levels would occur and, therefore, the impact would be less than significant. Additionally, the project would reduce impacts associated with on-site sources through the application of **Mitigation Measures 4.6-1 to 4.6-3** to less than significant. Consequently, the project contribution to cumulative noise impacts is not considered to be cumulatively considerable.

**Level of Significance Before Mitigation:** Less than significant.

**Mitigation Measures:** None are required.

**Level of Significance After Mitigation:** Less than significant.

**Threshold:** *Would result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.*

**Impact Analysis:** Vibration impacts are localized in nature and decrease with distance. Consequently, in order to achieve a cumulative increase in vibration, more than one source emitting high levels of vibration would need to be in close proximity to the noise receptor. None of the related projects would be located close enough to the project site where significant vibration impacts would occur from concurrent construction activities. The combined vibration effect of the related projects and the project's contribution would not be cumulatively significant.

**Level of Significance Before Mitigation:** Less than significant.

**Mitigation Measures:** None are required.

**Level of Significance After Mitigation:** Less than significant.

**Threshold:** *Would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

**Impact Analysis:** Noise impacts are localized in nature and decrease with distance. Consequently, in order to achieve a cumulative increase in noise, more than one source emitting high levels of noise would need to be located in close proximity to the noise receptor. The combined noise effect of related projects and the project's contribution could be cumulatively significant.

**Level of Significance Before Mitigation:** Significant.

**Mitigation Measures:** Implementation of **Mitigation Measures 4.8-3 to 4.8-7.**

**Level of Significance After Mitigation:** Significant.