

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 & Greenspan in August 2007. Complete copies of the traffic analysis and the acoustic analysis data are contained within 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 medium frequencies that more closely correspond with human speech. In response to the human ear's sensitivity or lack thereof to different frequencies, 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.¹ Changes from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. An increase of 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(A) 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

¹ 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.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 it would be 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 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).⁴ 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**.

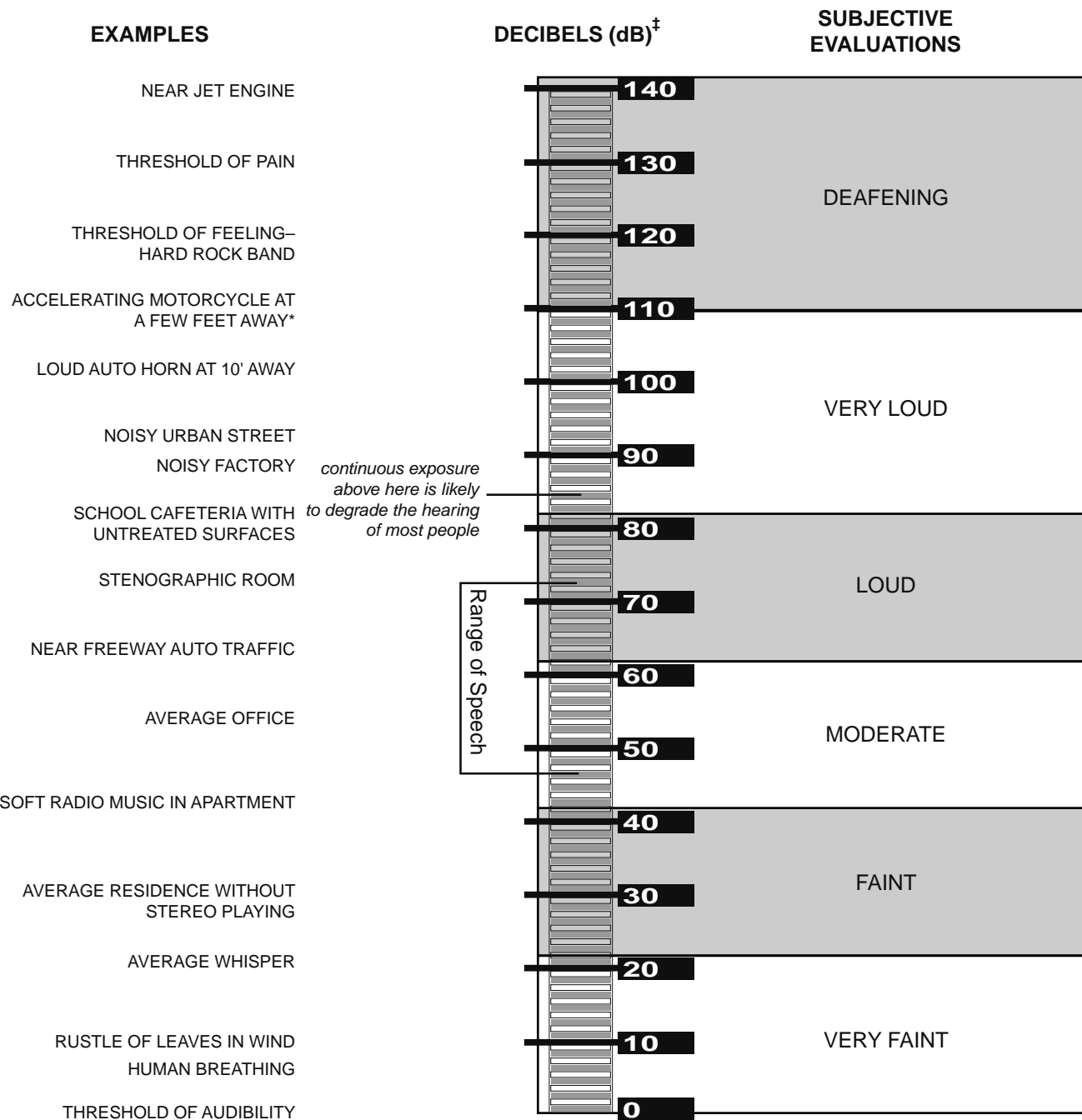
Table 4.6-1
Outside to Inside Noise Attenuation (dB(A))

Building Type	Open Windows	Closed Windows¹
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30
Hotels/Motels	17	25
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Source: *Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report 117.*

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

- ² 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.
- ³ 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.
- ⁴ 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.

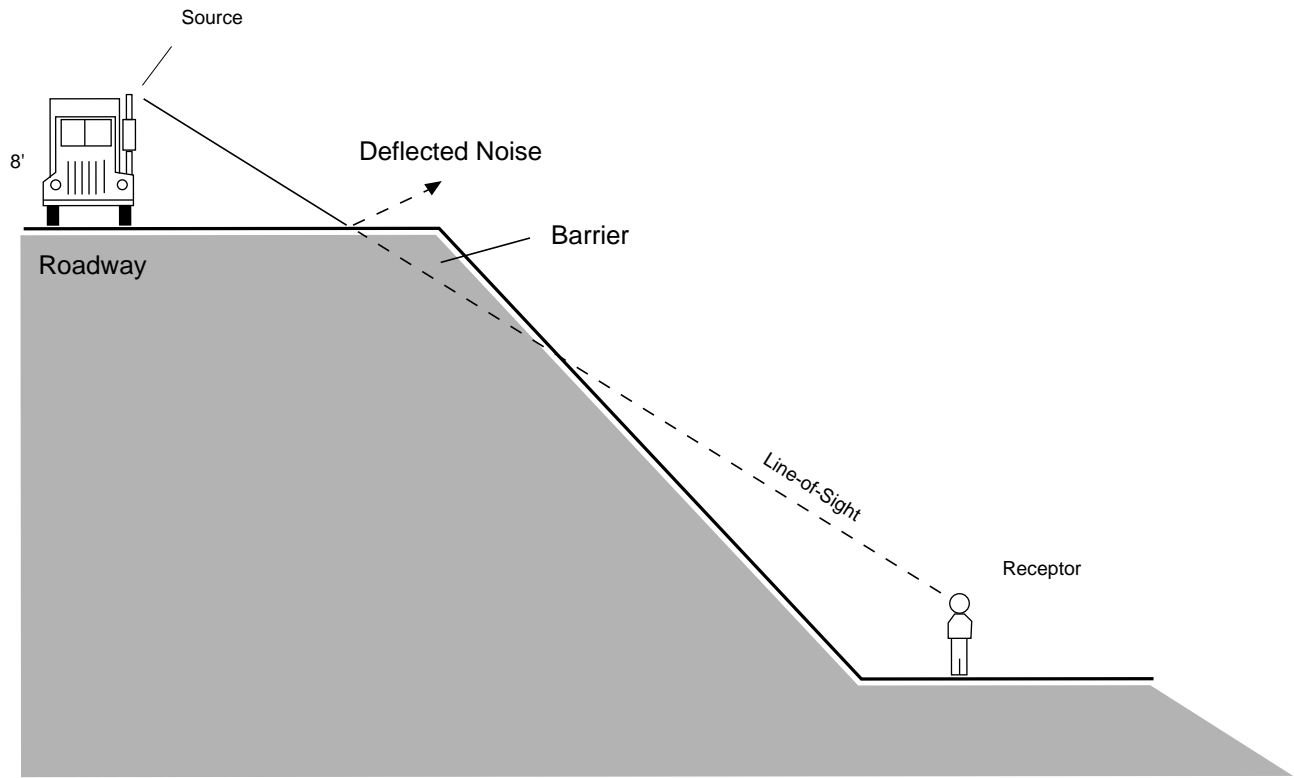


* NOTE: 50' from motorcycle equals noise at about 2000' from a four-engine jet aircraft.

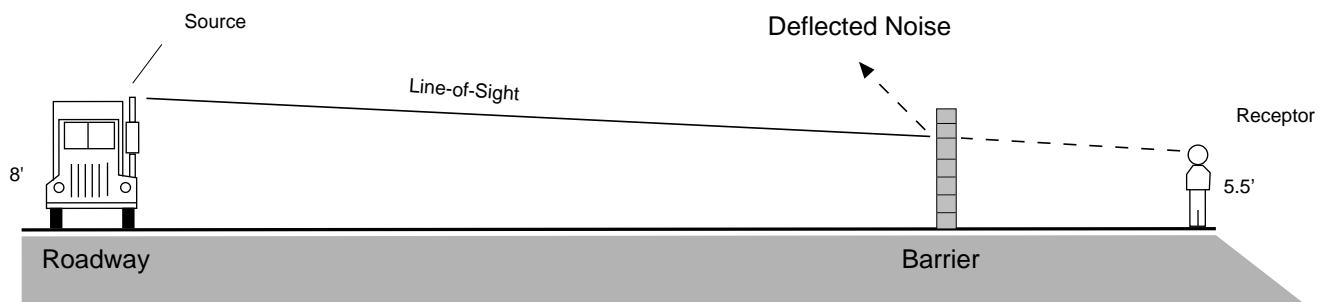
‡ NOTE: dB are "average" values as measured on the A-scale of a sound-level meter.

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

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.

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 time 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 after 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} .⁵

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, for example, 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 United States 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

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

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 typical groundborne vibration levels in VdB and human response to different levels of vibration.

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 land uses are in the City's Noise Ordinance, 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.

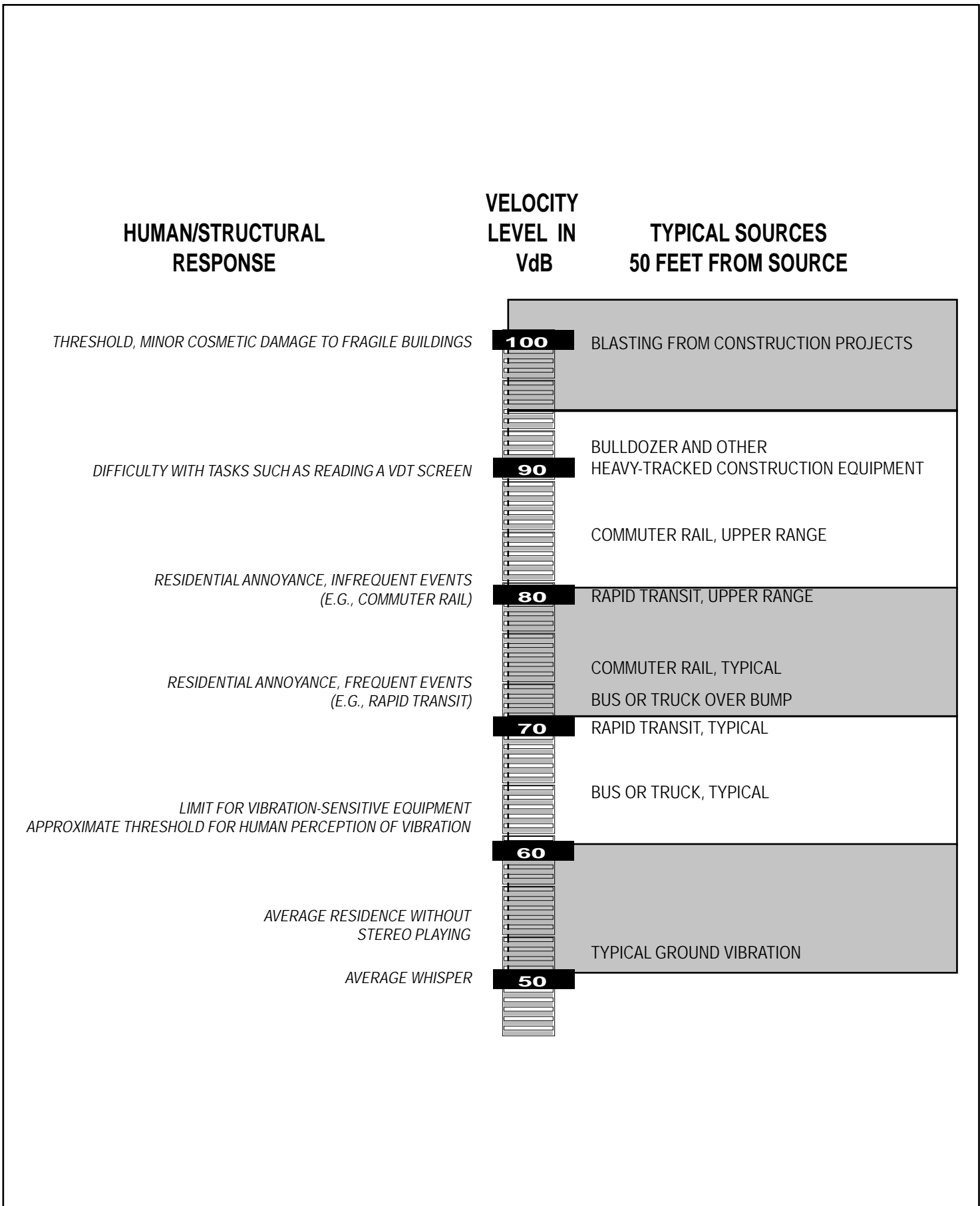


FIGURE 4.6-3

Typical Levels of Ground-Borne Vibration

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

Zone	Decibels	Time
Residential	45 dB(A)	Nighttime ¹
Residential	55 dB(A)	All other times

Source: City of Glendale Municipal Code.

¹ *Nighttime is defined as between 10:00 PM to 7:00 AM.*

In addition, Glendale’s General Plan Noise Element (adopted May 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. 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 City Center II project, a CNEL of 70 dB(A) would be considered “normally acceptable,” while for commercial uses, CNEL levels 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 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. 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 from 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 to be perceptible by an individual and does not establish maximum allowable vibration levels.

ENVIRONMENTAL SETTING

Existing Conditions

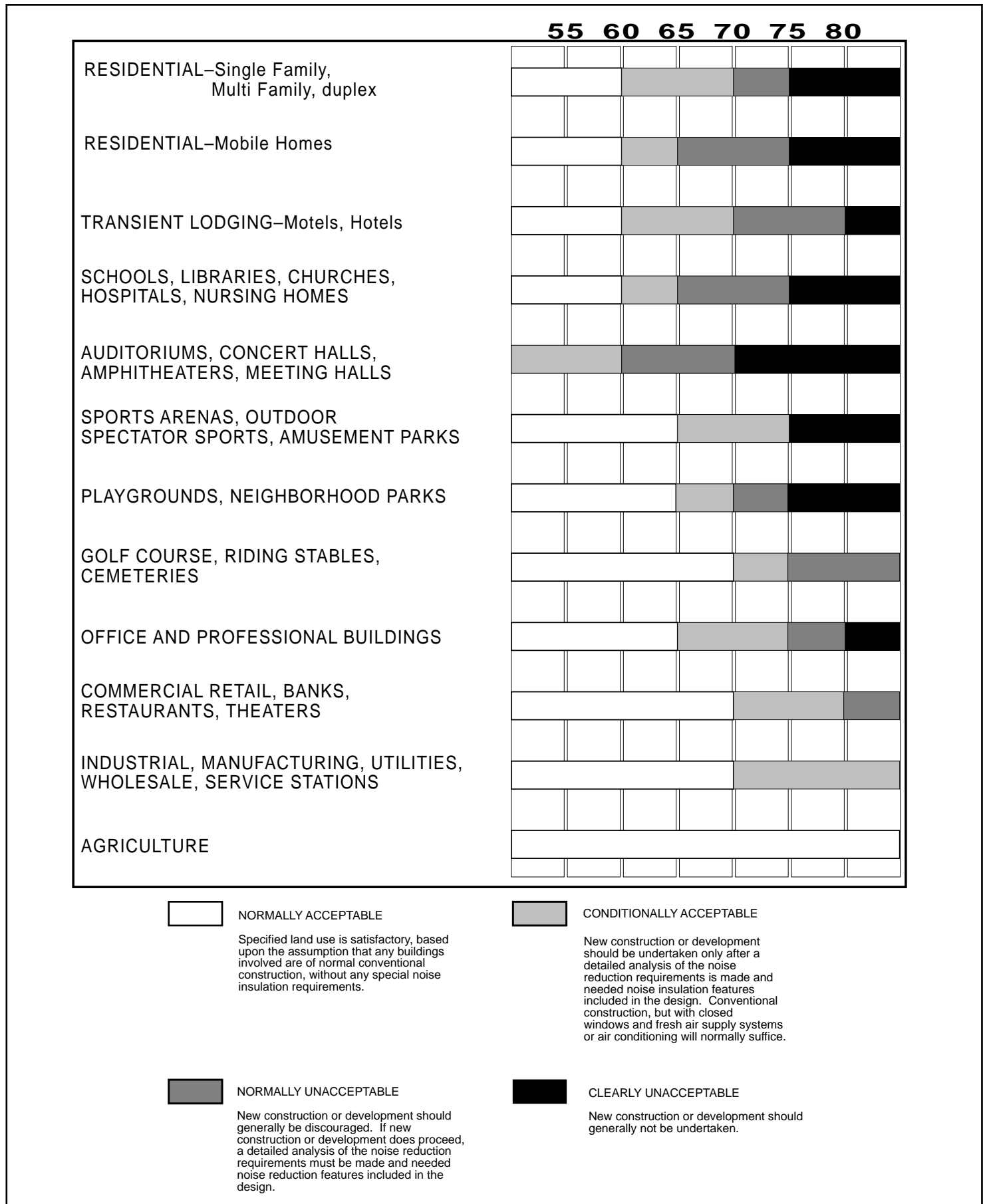
Noise Environment

Land uses surrounding the Project site consist of commercial and office uses. Therefore, no noise sensitive receptors exist within the immediate vicinity of the site.

The Project site is in an urban location and is exposed to noise sources typical of such a setting. As the Project site is a vacant lot, no stationary sources of noise currently exist on site. Off-site stationary noise sources in the area that are audible on the site include activities associated with commercial and office 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 Orange Street, Wilson Avenue, and Brand Boulevard.

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 on the Project site on: Monday, August 7 through Tuesday, August 8; Wednesday, August 9 through Thursday August 10; and Thursday, August 10 through Friday, August 11, 2006, for 24-hour periods. These noise levels are conservative since they were not measured during the weekend. Noise readings were taken in 1-hour intervals with "A" frequency fast time weighting. **Figure 4.6-5, Noise Monitoring Locations**, 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 were approximately 62.5 dB(A) CNEL on Orange Street south of Wilson and 62.8 dB(A) CNEL on Wilson Avenue west of Brand Boulevard. These monitored levels that are typical of commercial, office, dining and entertainment land uses. The high noise level readings of approximately 82.9 dB(A) CNEL calculated from the measurements conducted on Brand Boulevard south of Wilson Avenue, are attributable to noise generated by construction at the corner of Brand and Wilson and by buses using a nearby bus stop.



SOURCE: City of Glendale Noise Element

FIGURE 4.6-4

Land Use Compatibility to Noise



Legend:

1 Measurement Location



NOT TO SCALE

SOURCE: Impact Sciences, Inc. – September 2006

FIGURE 4.6-5

Noise Monitoring Locations

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

Location	Noise Sources	CNEL in dB(A) at 50 Feet from Roadway Centerline
Location No. 1 – On project site along Brand Boulevard 65 feet south of Wilson Avenue, approximately 4 feet from edge of Brand	Vehicles, Restaurant and Commercial Use Patrons, Construction Activities	82.9 dB(A)
Location No. 2 – On project site along Wilson Avenue midway between Brand Boulevard and Orange Street, approximately 2 feet from roadway edge.	Vehicles, Restaurant and Commercial Use Patrons	62.8 dB(A)
Location No. 3 – On project site along Orange Street 65 feet south of Wilson Avenue approximately 6 feet from roadway edge.	Vehicles, Restaurant and Commercial Use Patrons	62.5 dB(A)

Source: Impact Sciences, Inc., August 7, 8, 9, 10, and 11, 2006.

Existing Modeled Noise Levels

The existing ambient noise environment for the roadways was determined by calculating noise levels based on average daily trips (ADT) 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 57.3 to a high of 67.0 dB(A) CNEL.

Based on noise monitoring and noise modeling conducted, the existing noise levels around the Project site are below City threshold levels for commercial land uses.

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

Roadway Segment	CNEL in dB(A) at 50 Feet from Roadway Centerline
Wilson west of Central	57.3
Wilson west of Orange	58.9
Wilson west of Brand	59.5
Wilson east of Brand	60.3
Broadway west of Central	62.8
Broadway west of Orange	63.0
Broadway west of Brand	62.9
Broadway east of Brand	62.5
Central north of Wilson	66.8
Central north of Broadway	67.0
Central south of Broadway	66.2
Orange north of Wilson	58.2
Orange north of Broadway	58.2
Orange south of Broadway	57.3
Brand north of Wilson	62.9
Brand north of Broadway	63.4
Brand south of Broadway	62.6

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

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 as a result of the implementation of the 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, Engineers, 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 levels 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 of 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 from 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.

Threshold: **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 standard 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:

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 existing noise levels to existing plus Project noise levels. The results of the modeled weekday roadway noise levels are provided below in **Table 4.6-6, Weekday Operational Roadway Noise Levels**. Changes in CNEL levels as a result of the Project will range from 0.0 dB(A) to 0.5 dB(A). None of the roadway segments would result in an increase in CNEL of greater than 3 dB(A) during the weekday as a result of 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.

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

Roadway Segment	Existing Project	Existing Noise Levels Plus Project	Change in Noise Levels	Significant Project Impact
Wilson west of Central	57.3	57.4	0.1	NO
Wilson west of Orange	58.9	59.2	0.3	NO
Wilson west of Brand	59.5	60.0	0.5	NO
Wilson east of Brand	60.3	60.4	0.1	NO
Broadway west of Central	62.8	62.8	0.0	NO
Broadway west of Orange	63.0	63.1	0.1	NO
Broadway west of Brand	62.9	63.0	0.1	NO
Broadway east of Brand	62.5	62.5	0.0	NO
Central North of Wilson	66.8	66.9	0.1	NO
Central north of Broadway	67.0	67.0	0.0	NO
Central south of Broadway	66.2	66.2	0.0	NO
Orange North of Wilson	58.2	58.3	0.1	NO
Orange north of Broadway	58.2	58.5	0.3	NO
Orange south of Broadway	57.3	57.3	0.0	NO
Brand North of Wilson	62.9	63.0	0.1	NO
Brand north of Broadway	63.4	63.5	0.1	NO
Brand south of Broadway	62.6	62.7	0.1	NO

All values are listed in dB(A)

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

As shown in **Table 4.6-6**, existing plus Project modeled noise levels on the Project site would be approximately 63.4 dB(A) CNEL for Brand Boulevard south of Wilson Avenue, 60.0 dB(A) CNEL for Wilson Avenue west of Brand Boulevard, and 58.5 dB(A) CNEL for Orange Street south of Wilson Avenue. These noise levels are consistent with the monitored results for Wilson Avenue and Orange Street, but differ from the Brand Boulevard measurement of 82.9 dB(A) CNEL, which was influenced by noise from a construction project located under way at the corner of Brand Boulevard and Wilson Avenue and noise from a local bus stop. The modeled results were well below the Glendale Municipal Code exterior noise threshold of 65 dB(A) for residential uses, and if the Project were to develop exterior living areas along Wilson Avenue and Orange Street, such as patios or exterior useable areas, impacts would not be significant. In addition, interior noise levels in the building along these roadways could be below the interior threshold of 55 dB(A) during the daytime and 45 dB(A) during the nighttime resulting in less than significant interior noise level as well.

Level of Significance Before Mitigation: Less Than Significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less Than Significant.

Parking Structures – Development of the Project would introduce an eight-level parking garage on the site. Four 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 Brand Boulevard on the east side of the 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 on-site residents and may exceed the 65 dB(A) Municipal Code threshold at receptor locations.

Level of Significance Before Mitigation: Significant.

Mitigation Measures: The following mitigation measure is provided to reduce noise levels associated with the parking structure to acceptable levels:

- 4.6-1 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 and/or full walls on the sides of the structure that are facing 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.⁶ 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: The following mitigation measure is provided to reduce noise levels associated with street sweeper operations to acceptable levels during the early morning and late evening periods:

4.6-2 On-site sweeper operations shall be restricted to between the hours of 7:00 AM to 10:00 PM.

Level of Significance After Mitigation: Less than significant.

On-Site Retail Uses – Future residents within the Project may experience noise due to human activity within the area from patrons using commercial/retail businesses 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.

Residential On-Site Development – Future residents located on the Project, 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

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

dB(A) CNEL.⁷ 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: Persons working in the area surrounding the Project site could be exposed to excessive groundborne vibration or groundborne noise levels from construction activities. 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.

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.

⁷ 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.

As indicated in **Table 4.6-7**, pile drivers and large bulldozers are capable of producing approximately 87 and 81 VdB, respectively, at 50 feet, the approximate distance to the nearest structure. Land uses surrounding the Project consist of commercial and office uses that do not contain sensitive equipment, are not located where persons sleep, and are not 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: Project construction is anticipated to consist of four phases: Vegetation Removal, Grading/Excavation, Sub-Grade Construction, and Building Construction. The total construction period is anticipated to last approximately 32 months. The following provides a general overview of the various phases of construction.

Phase I: Vegetation Removal: During this phase of construction the existing vegetation and on site trees would be removed. Removal of materials would involve the use of standard construction equipment such as loaders, dozers, and other related equipment. This phase of construction is anticipated to take approximately one week to complete. This work is anticipated to produce approximately 1,100 cubic yards of organic export material. This correlates to approximately 55 trucks, assuming tandem trucks with the capacity to carry up to 20 cubic yards of material per truck.

Phase II: Grading/Excavation: This grading phase would require excavation of depths up to 40 feet below the ground surface. Heavy construction equipment would be located on site during grading activities and would not travel to and from the Project site on a daily basis. It is anticipated that equipment needs associated with grading activities would include a loaders, dozers, scrapers, compactors, vibratory rollers, and other related heavy-duty equipment. This work would likely produce an estimated 86,830 cubic yards of soil/material export. This phase of construction is anticipated to be completed in approximately four months (88 days).

Phase III: Sub-Grade Building Construction (Sub-structure): This phase would include the sub-grade construction. It is anticipated that equipment needs associated with sub-grade construction activities would include concrete trucks, cranes, pumps, and various miscellaneous machinery and related equipment. This work would likely produce an estimated 39,950 cubic yards of concrete material. This

phase of construction is anticipated to be completed in approximately eight months (176 days, assuming 22 work days per month). It is assumed that concrete mixer trucks with a capacity to carry up to 10 cubic yards of material concrete would be used.

Phase IV: Above Street Level Construction (Super-structure) and Interior Work: This phase would include the above street level structure construction and the interior finish work. It is anticipated that equipment needs associated with building construction activities would include concrete trucks, cranes and various miscellaneous machinery and related equipment. During this phase of construction, a work force of approximately 250 construction workers is anticipated. Material delivery trucks and other miscellaneous trucks are anticipated during this phase of construction. This phase is anticipated to be completed in approximately 20 months.

Equipment used during the construction phases would generate both steady-state and episodic noise that would be heard both on and off the 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 50 feet from existing commercial and office uses. Noise levels generated during each phase of the Project 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 worst-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 the central business district, as allowed by the Glendale Municipal Code.

Table 4.6-8
Estimated Noise Levels for Construction Phases

Construction Phase	Approximate L_{eq} (dBA) without Noise Attenuation			
	50 Feet	100 Feet	200 Feet	300 Feet
Vegetation Removal	90	84	78	75
Site Grading	91	85	79	75
Subgrade and Above Street Level Building Construction	95	89	83	79

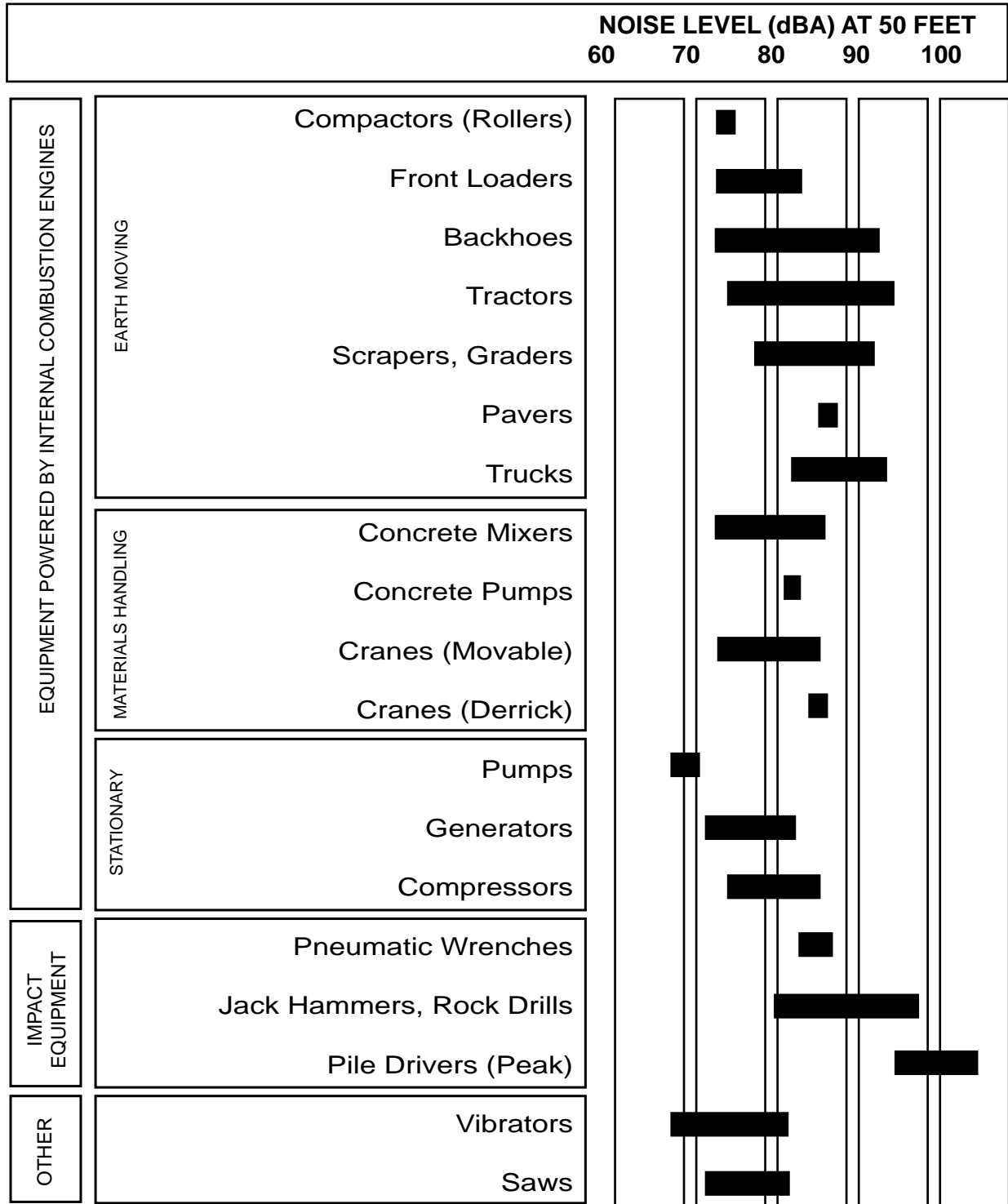
Source: Model results are contained in *Appendix 4.6*.

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 site 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 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 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:

- 4.6-3 All construction activity within the City shall be conducted in accordance with Section 8.36.080 of the Glendale Municipal Code.
- 4.6-4 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 is in good working condition;
 - Place noise-generating construction equipment and construction staging areas away from sensitive uses, where feasible;
 - Schedule high noise-producing activities between the hours of 8:00 AM and 5:00 PM to minimize disruption at 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;



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

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.
- 4.6-5 The project applicant shall require by contract specifications that construction staging areas along with the operation of earthmoving equipment within the project area would 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.
- 4.6-6 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** in **Section 4.0** will be considered to contribute to cumulative noise impacts. Noise by definition is a localized phenomenon, and decreases as distance from the source increases. Consequently, only projects and growth due to occur in the general area of the Project 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 the 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 be in compliance with these standards, and as noted above, would achieve compliance. Consequently, the Project's 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 1.3 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 Noise Levels (A)	Future Noise Levels with Project	Cumulative Change in Noise Levels	Cumulative Project Impact
Wilson west of Central	57.3	57.9	0.6	NO
Wilson west of Orange	58.9	59.7	0.8	NO
Wilson west of Brand	59.5	60.5	1.0	NO
Wilson east of Brand	60.3	60.8	0.5	NO
Broadway west of Central	62.8	63.4	0.6	NO
Broadway west of Orange	63.0	63.8	0.8	NO
Broadway west of Brand	62.9	63.9	1.0	NO
Broadway east of Brand	62.5	63.6	1.1	NO
Central north of Wilson	66.8	67.5	0.7	NO
Central north of Broadway	67.0	67.6	0.6	NO
Central south of Broadway	66.2	66.8	0.6	NO
Orange north of Wilson	58.2	58.8	0.6	NO
Orange north of Broadway	58.2	59.4	1.2	NO
Orange south of Broadway	57.3	57.9	0.6	NO
Brand north of Wilson	62.9	63.8	0.9	NO
Brand north of Broadway	63.4	64.3	0.9	NO
Brand south of Broadway	62.6	63.9	1.3	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 Glendale's 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. As such, 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 4.6-3 to 4.6-6** to less than significant levels. Consequently, the Project contribution to cumulative noise impacts is not 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. One such related project, the Orange-Wilson Mixed-Use project is located in close enough proximity to the Project to result in cumulative vibration impacts. The Orange-Wilson project by itself could generate vibration levels between 65 VdB and 75 VdB at adjacent locations. The combination of construction activities associated with the Orange-Wilson and City Center II projects could all or partially occur during the same period. Therefore, there is the potential for combined construction vibration impacts if activities are occurring simultaneous. However, as land uses located within the immediate vicinity of both projects do not contain sensitive equipment, are not located where persons sleep, and would be temporary in duration, the combined vibration effect of the related projects and the project's contribution to the impact would be less than 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. One such related project, the Orange-Wilson Mixed-Use project is located in close enough proximity to the Project site to result in cumulative noise impacts. The Orange-Wilson project by itself would generate noise levels above the acceptable City of Glendale noise threshold of 65 dB(A). The combination of construction activities associated with the Orange-Wilson and City Center II projects could all or partially occur during the same period. Therefore, there is the potential for combined construction noise impacts if activities are occurring simultaneous. The combined noise effect of related projects, such as the Orange/Wilson Project and the Project's contribution could be cumulatively significant. **Level of Significance Before Mitigation:** Significant.

Mitigation Measures: Implementation of **Mitigation Measures 4.6-3 to 4.6-6** on a project-by project basis.

Level of Significance After Mitigation: Significant and unavoidable.