4.7 NOISE

INTRODUCTION

This section of the Environmental Impact Report (EIR) presents the results of an analysis of both existing background conditions and future noise conditions following completion of the proposed project. These findings also reflect the project traffic study, prepared by Linscott, Law, and Greenspan in May 2013. Complete copies of the acoustic analysis and the traffic analysis are contained in **Appendix 4.7** and **Appendix 4.9** 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 A-weighted decibels (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 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 decibel (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 4.7-1, 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 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: US 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 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 4.7-2, 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 4.7-1, Outside to Inside Noise Attenuation**.

Table 4.7-1
Outside to Inside Noise Attenuation (dB(A))

Building Type	Open Windows	Closed Windows[1]
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.

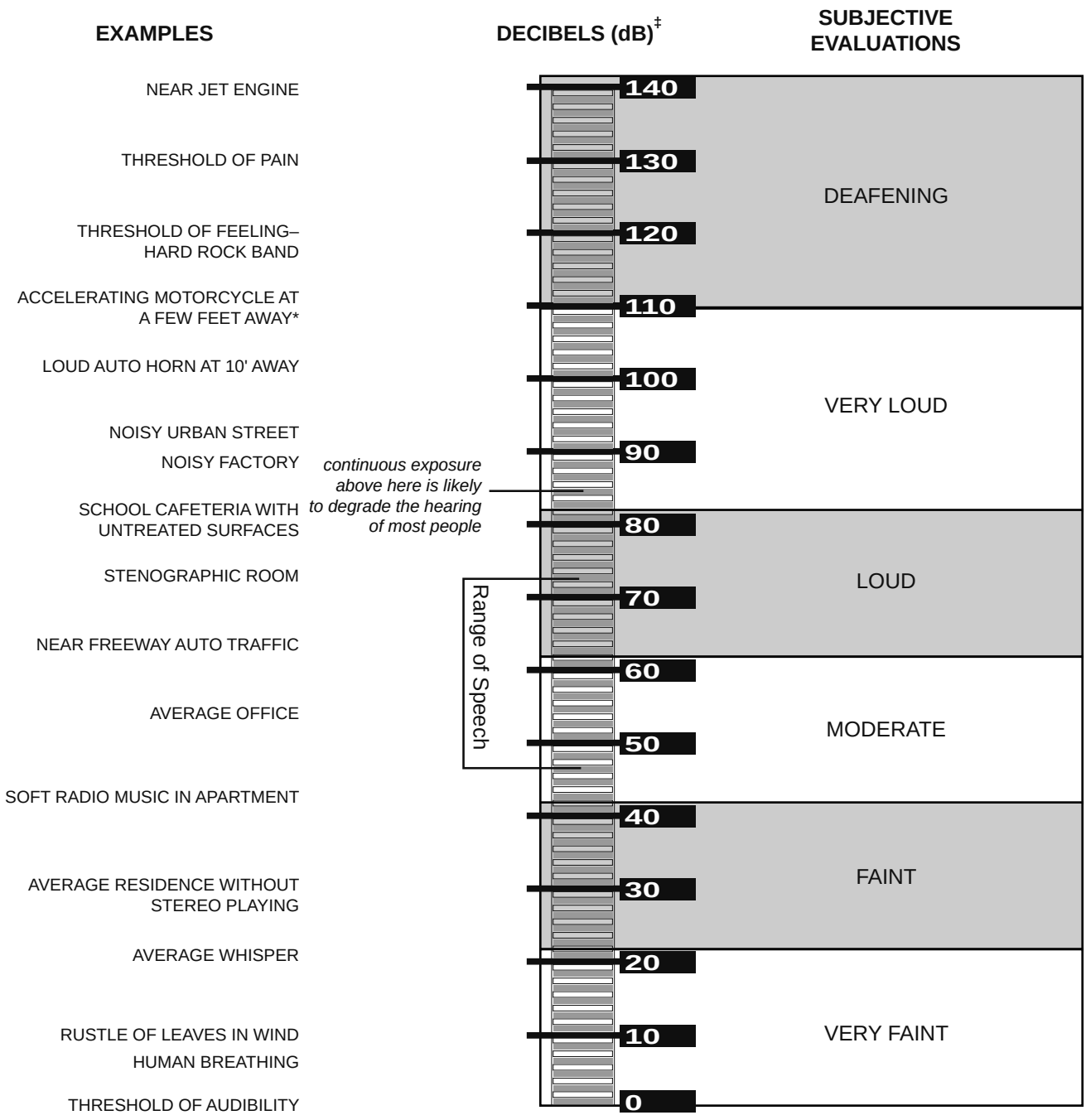
[1] *As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dB(A).*

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.

2 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: US 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 US Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: US Department of Transportation, Federal Highway Administration, September 1980), p. 97.

4 US Department of Transportation, Federal Highway Administration, *Highway Noise Mitigation*, (Springfield, Virginia: US Department of Transportation, Federal Highway Administration, September 1980), p. 18.

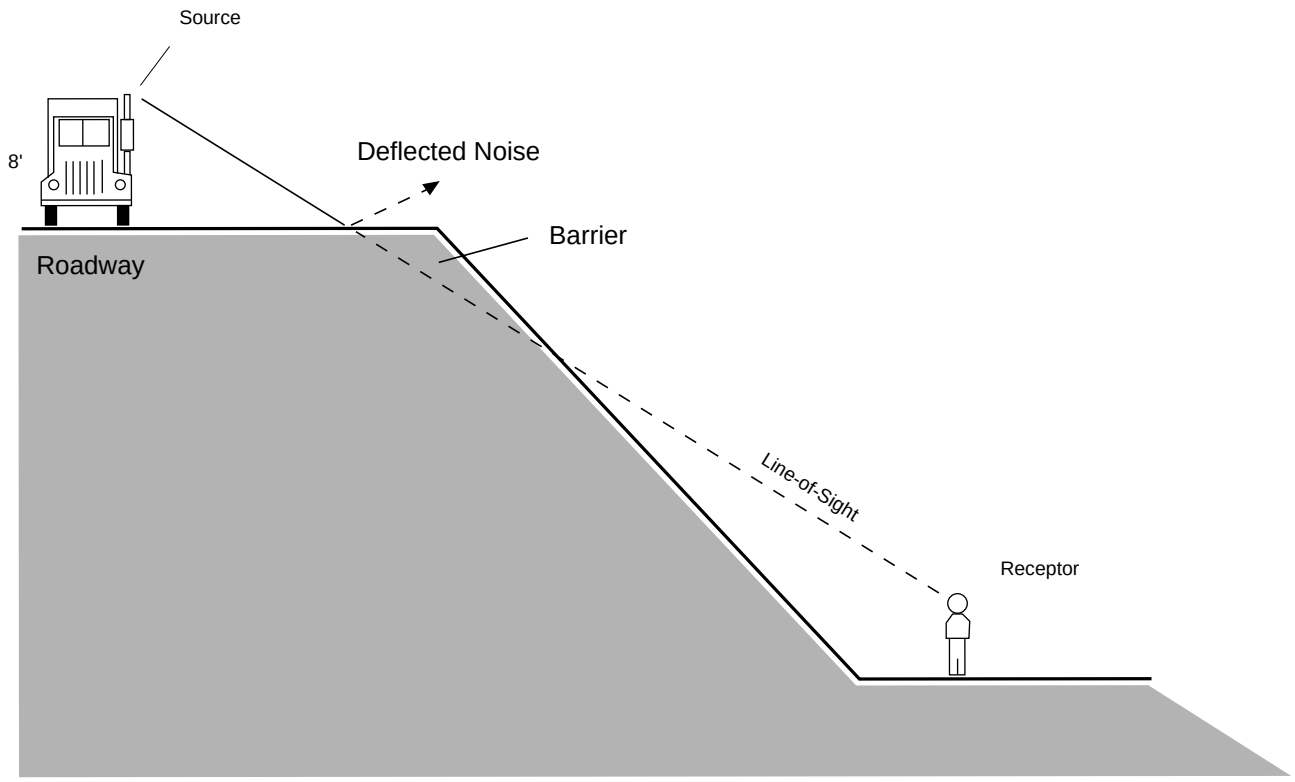


** NOTE: 50' from motorcycle equals noise at about 2000' from a four-engine jet aircraft.*

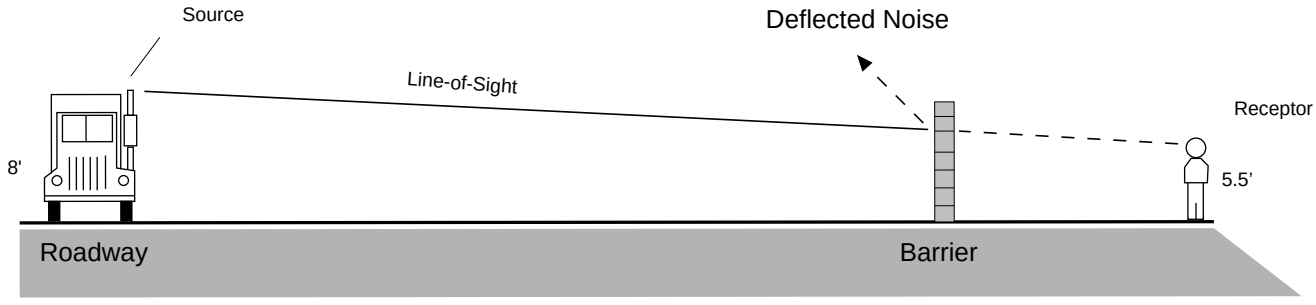
‡ *NOTE: dB are "average" values as measured on the A–scale of a sound–level meter.*

FIGURE **4.7-1**

Common Noise Levels



"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

SOURCE: Impact Sciences, Inc. – June 2010

FIGURE **4.7-2**

Noise Attenuation by Barriers

Those that are applicable to this analysis are the Equivalent Noise Level (Leq) and the Community Noise Equivalent Level (CNEL). Leq is the average A-weighted sound level measured over a given time interval. Leq 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 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 dB to sound levels occurring during the evening from 7:00 PM to 10:00 PM, and 10 dB to sound levels occurring during the nighttime from 10:00 PM to 7:00 AM. The 5 dB and 10 dB "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 Leq measurements typically results in a CNEL measurement that is within approximately 3 dB(A) of the peak-hour Leq.[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; 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 US 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 4.7-3, 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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5 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 proposed 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 Municipal Code, exterior and interior noise is regulated by reference to "presumed noise standards," which are presented below in **Table 4.7-2, Exterior Presumed Noise Standards**, and **Table 4.7-3, Interior Presumed Noise Standards**. Under Section 8.36.050 of the Municipal Code, 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, the actual ambient noise levels shall not exceed the presumed noise level by more than 5 dB(A).

Table 4.7-2
Exterior Presumed Noise Standards

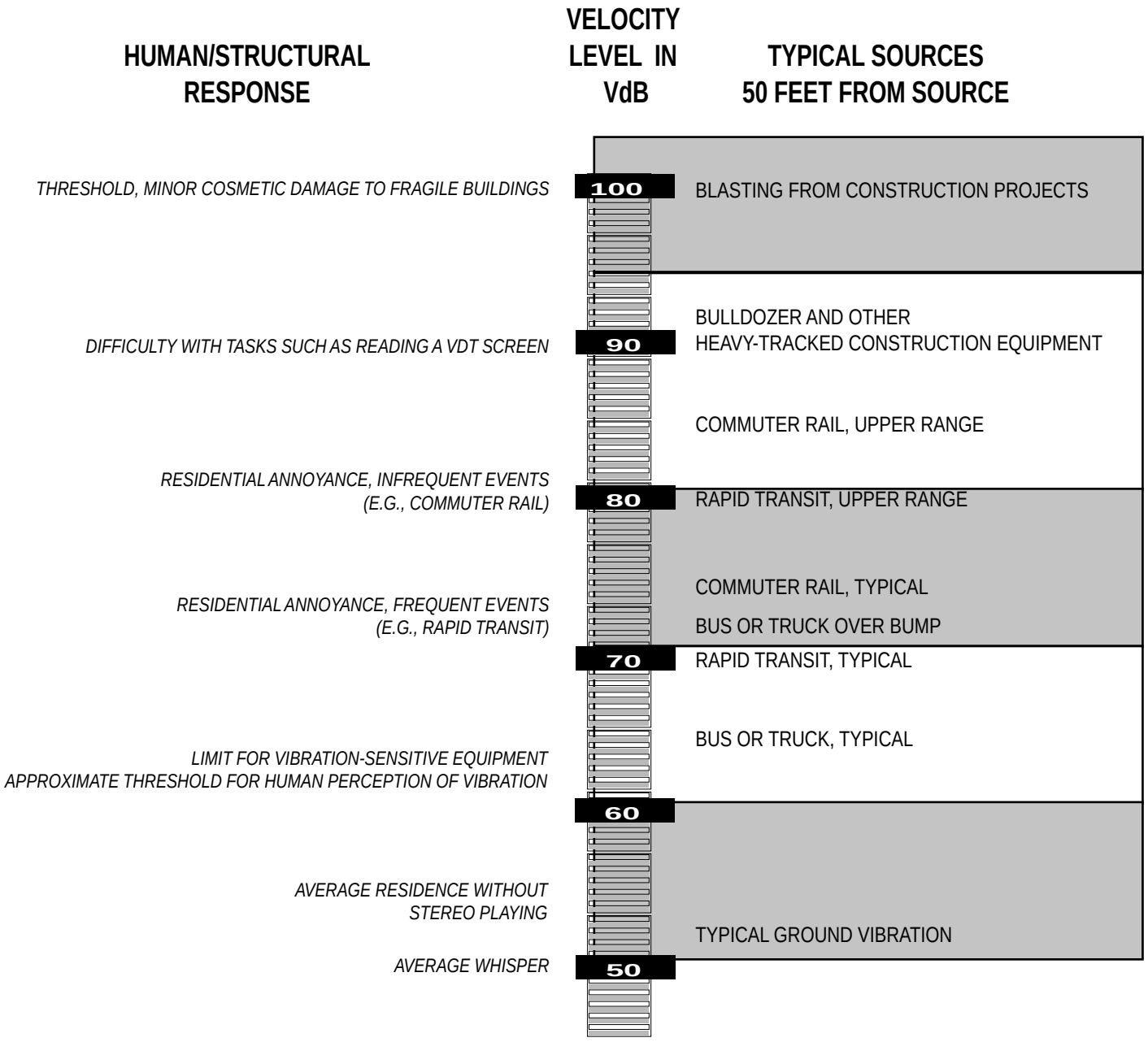
Zone	Standard	Maximum	Time
Residential (multi-family, hotels, motels and transient lodgings)	60 dB(A)	65 dB(A)	Anytime
Central Business District and Commercial	65 dB(A)	70 dB(A)	Anytime

Source: City of Glendale Municipal Code.

Table 4.7-3
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.



SOURCE: United States Department of Transportation, "Transit Noise and Vibration Impact Assessment", Office of Planning and Environment Federal Transit Administration, May 2006

FIGURE **4.7-3**

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 of Glendale. **Figure 4.7-4, Land Use Compatibility to Noise**, identifies the acceptable limit of noise exposure for various land use categories within the City of Glendale. Noise exposure for a multi-family residential land use, such as those included in the proposed project, is "normally acceptable" when the CNEL at exterior residential locations is equal to or below 65 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 included in the proposed project, a CNEL of 70 dB(A) would be considered "normally acceptable," a CNEL between 67.5 and 77.5 dB(A) would be considered "conditionally acceptable," and a CNEL greater than 75 dB(A) would be considered "normally unacceptable." These guidelines apply to noise sources such as vehicular traffic.

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 of Glendale 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 City of Glendale Municipal Code provides that vibration created by the operation of any device would be a violation of City of Glendale 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

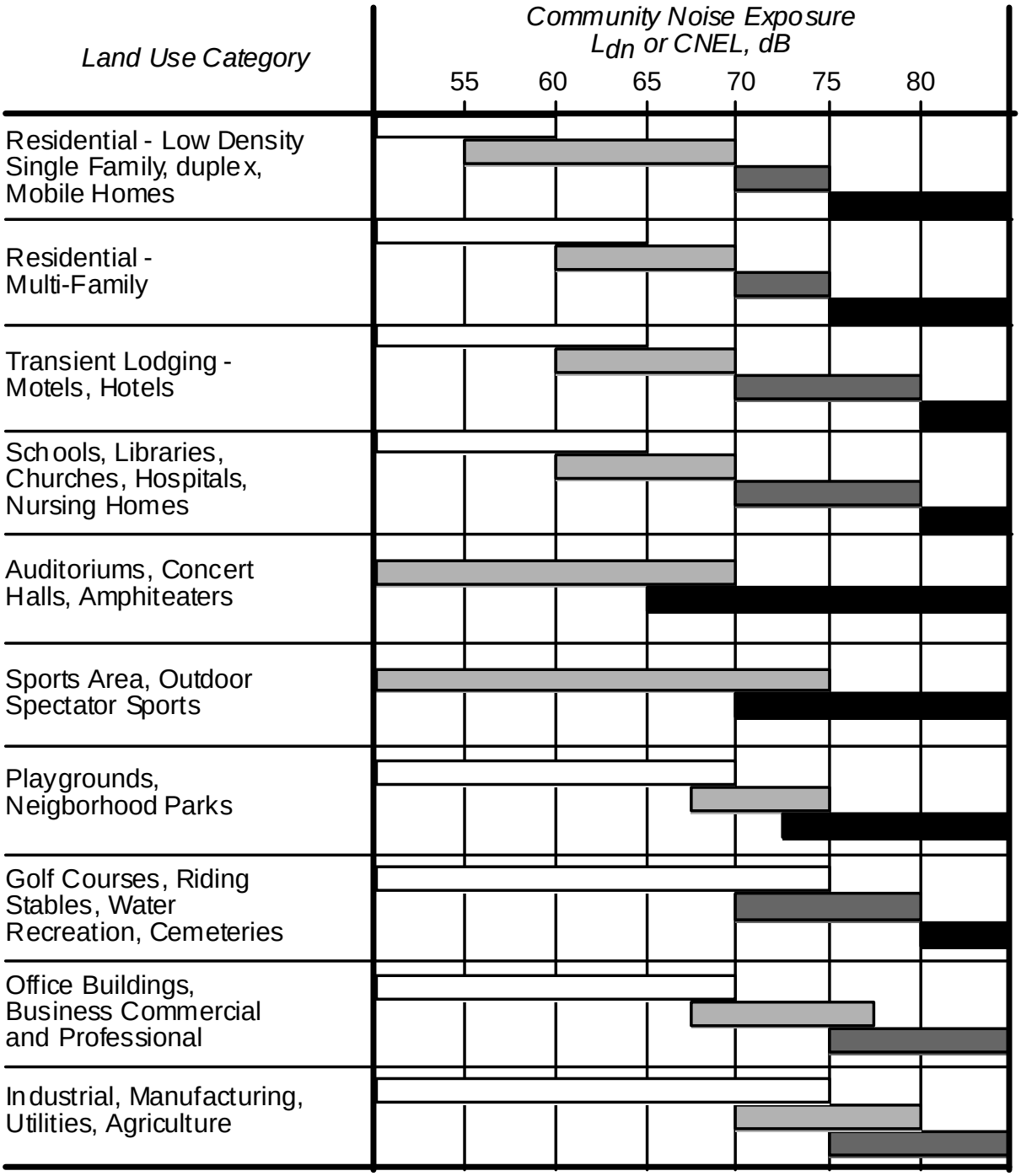
Land uses surrounding the project site consist mainly of commercial and office uses. Surrounding uses to the north include retail-commercial (CVS Pharmacy). The proposed mixed-use Glendale Triangle project is currently under construction and is located northeast of the site on San Fernando Road. Glendale Memorial Hospital is located to the east, on Central Avenue. Additional nearby uses include a Vons Grocery store to the east and the Glendale Transportation Center is located southwest along Central Avenue. Noise sensitive receptors located within the immediate vicinity of the project site include Glendale Memorial Hospital.

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. The existing commercial development within the project site is expected to create noise typical of such uses, including traffic noise from employees and others traveling to and from the site and stationary noise from rooftop equipment such as air conditioning units. Off-site stationary noise sources in the area that are audible on the project 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 audible on the site are related to traffic along San Fernando Road and Central Avenue.

Roadway Traffic Noise

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 4.7-4, Existing Roadway Modeled Noise Levels.** As shown, roadway noise levels range from a low of 52.2 to a high of 64.3 dB(A) CNEL.

Based on noise modeling conducted, the existing noise levels around the project site do not exceed City of Glendale standards for residential land uses.



INTERPRETATION

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

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

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

Clearly Unacceptable
New construction or development should generally not be undertaken.

SOURCE: State of California, "General Plan Guidelines," – 1998

FIGURE **4.7-4**

Land Use Compatibility to Noise

Table 4.7-4
Existing Roadway Modeled Noise Levels

Roadway Segment	CNEL in dB(A) at 75 Feet from Roadway Centerline
Brand Boulevard	
north of San Fernando Road	62.7
south of San Fernando Road	63.0
San Fernando Road	
north of Los Feliz Boulevard	62.7
between Los Feliz Boulevard and Central Avenue	61.3
between Central Avenue and Brand Boulevard	64.3
east of Brand Boulevard	62.8
Central Avenue	
north of Los Feliz Boulevard	60.5
between Los Feliz Boulevard and San Fernando Road	58.1
south of San Fernando Road	52.2
Gardena Avenue	
north of Los Feliz Boulevard	52.8
south of Los Feliz Boulevard	53.0
Los Feliz Boulevard	
west of Gardena Avenue	63.8
between Gardena Avenue and San Fernando Road	63.5
between San Fernando Road and Central Avenue	62.0
east of Central Avenue	60.4

Source: Impact Sciences, Inc. Model results are contained in ***Appendix 4.7****.*

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 4.9, Traffic**, 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 *California Environmental Quality Act (CEQA) Guidelines*. The *State CEQA Guidelines* ask whether the proposed 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, exposure of people residing or working in the project area to excessive noise levels (impacts were determined to be less than significant in the Initial Study)
- For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels (impacts were determined to be less than significant in the Initial Study)

The *State 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 the proposed project's impacts and cumulative impacts.

Noise

On-Site Noise Thresholds

As shown in **Figure 4.7-4**, 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

proposed 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 multi-family residential uses, 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 of Glendale'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 proposed 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 of Glendale 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 of Glendale'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 of Glendale'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 of Glendale'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 of Glendale. Increases in traffic noise greater than 5 dB(A) would be considered to be significant even if the resulting noise levels are below City of Glendale standards.

- Stationary noise sources proposed as part of the proposed project that could result in increases in noise levels at adjacent land uses that exceed City of Glendale standards would be considered significant.

Vibration

Vibration Thresholds

The City of Glendale's Municipal Code states that a violation of City of Glendale 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 of Glendale's Municipal Code. The Federal Transit Administration 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). These thresholds are used in this analysis to identify significant impacts.

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 site vicinity above levels existing without the proposed project?

As stated previously, based on noise modeling conducted, the existing ambient noise level around the project site does not exceed City of Glendale threshold exterior noise levels for residential land uses.

Vehicle Noise – Vehicular noise can potentially affect the project site, as well as land uses located along the studied roadway system, including nearby noise sensitive receptors. Based on the distribution of traffic volumes, noise modeling was conducted for the roadways analyzed in **Section 4.9, Traffic**. Specifically, forecasts were calculated by comparing the existing noise to existing plus proposed project. The results of the modeled weekday roadway noise levels are provided below in **Table 4.7-5, Operational Roadway Noise Levels**. The analysis in this section follows the project traffic impact analysis (TIA) in analyzing only project options 1 and 2. Options 3 and 4 are considered in the TIA, and are determined to result in the generation of less traffic than project option 1. Therefore, the analysis presented in both the TIA and this section present a conservative, worst-case scenario for traffic noise.

Table 4.7-5
Operational Roadway Noise Levels

Roadway Segment	Existing Noise Levels Without Project	Existing Noise Levels Plus Project)	Change in Noise Levels	Existing Noise Levels Plus Option 2	Change in Noise Levels	Significant Project Impact
Brand Boulevard						No
North of San Fernando Road	62.7	62.7	-	62.7	-	No
South of San Fernando Road	63.0	63.0	-	63.0	-	No
San Fernando Road						No
North of Los Feliz Boulevard	62.7	62.8	0.1	62.8	0.1	No
Between Los Feliz Boulevard and Central Avenue	61.3	61.4	0.1	61.4	0.1	No
Between Central Avenue and Brand Boulevard	64.3	64.3	-	64.3	-	No
East of Brand Boulevard	62.8	62.8	-	62.8	-	No
Central Avenue						No
North of Los Feliz Boulevard	60.5	60.5	-	60.5	-	No
Between Los Feliz Boulevard and San Fernando Road	58.1	58.2	0.1	58.3	0.2	No
South of San Fernando Road	52.2	53.4	1.2	53.4	1.2	No
Gardena Avenue						No
North of Los Feliz Boulevard	52.8	52.8	-	52.8	-	No
South of Los Feliz Boulevard	53.0	53.1	0.1	53.1	0.1	No
Los Feliz Boulevard						No
West of Gardena Avenue	63.8	63.8	-	63.8	-	No
Between Gardena Avenue and San Fernando Road	63.5	63.5	-	63.5	-	No
Between San Fernando Road and Central Avenue	62.0	62.0	-	62.0	-	No
East of Central Avenue	60.4	60.4	-	60.4	-	No

All values are listed in dB(A)
Source: Impact Sciences, Inc. Model results are contained in ***Appendix 4.7****.*

Changes in CNEL levels resulting from the proposed project would range from 0.0 dB(A) to 1.2 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 proposed 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. In addition, the noise level on all streets analyzed would be below the City of Glendale Municipal Code exterior noise threshold of 65 dB(A) for residential uses. Potential impacts are, therefore, considered to be less than significant.

As shown in **Table 4.7-5**, existing plus proposed project modeled noise levels on the project site along San Fernando Road between Los Feliz Boulevard and Central Avenue would be approximately 61.4 dB(A) CNEL, and along Central Avenue south of San Fernando Road would be about 53.4 dB(A) CNEL. In both cases, noise levels would be below the City of Glendale Municipal Code exterior noise threshold of 65 dB(A) for residential uses. Therefore, impacts with regard to exterior noise levels would be less than significant. In addition, interior noise levels in the building along these roadways would be below the interior threshold of 55 dB(A) during the daytime and 45 dB(A) during the nighttime based on a typical reduction of 25 dB(A) of exterior to interior noise levels due to construction techniques. This is not to imply that greater reductions are not possible. In fact, noise levels reduction of 25, 30, and 35 dB(A) from buildings are common.[6], As a result, impacts with regard to interior noise levels would be less than significant.

Development Options

As discussed above, and shown in **Table 4.7-5**, operational roadway noise would not vary substantially between the development options as trip generation would not vary considerably. Therefore, impacts associated with vehicle noise would 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.

Parking Structures – Development of the proposed project would introduce two levels of subterranean parking on the project site 4. Development of the proposed project would place residential uses near or adjacent to the parking facilities. 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

6 Wyle Acoustics Group (March 2003), New Construction Acoustical Design Guidelines, A-1 – A-8.

be a source of annoyance due to automobile engine start-ups and acceleration, and the activation of car alarms. Parking structures can generate noise levels of between 49 dB(A) Leq (tire squeals) to 74 dB(A) Leq (car alarms) at 50 feet. Due to the level of traffic noise along streets surrounding the project site, normal daytime parking structure Leq noise would not likely be audible due to the masking of noise by traffic on nearby roadways. However, loud single noise events could be an annoyance to site residents and may exceed the 65 dB(A) Municipal Code threshold at nearby receptor locations. However, with typical construction techniques, interior noise levels in the building along these roadways would be below the interior threshold of 55 dB(A) during the daytime and 45 dB(A) during the nighttime. As a result, impacts with regard to interior noise levels would be less than significant for all project options.

Development Options

Development Options 2 and 4 would include a parking mezzanine. Access to the mezzanine would be provided via an additional ramp up from the ground floor. While noise sources would be closer to the residential uses under these two options, as was discussed with the proposed project, with typical construction techniques, interior noise levels along these roadways would be below the "normally acceptable" exterior noise level threshold of 65 dB(A) CNEL and the interior threshold of 55 dB(A) during the daytime and 45 dB(A) during the nighttime. Therefore impacts with regard to interior noise levels would 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.

On-Site Commercial Uses – Future residents within the project site and nearby sensitive receptors may experience noise due to human activity within the area proposed for on-site commercial development. Potential noise sources associated with commercial uses on-site include people talking, delivery trucks, cellular telephones, 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.

Development Options

Commercial activity on the site would not change substantially between the development options, 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 site, as well as off-site uses, including nearby sensitive receptors, 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.[7] Overall, the noise generated by the proposed project's residential land uses would not exceed the City of Glendale's compatibility thresholds and is considered to be less than significant.

Development Options

Noise associated with on-site development would not change substantially among the development options. Therefore, overall, the noise generated by the proposed project's residential land uses would not exceed the City of Glendale'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?

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 proposed 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.

7 US Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

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 4.7-6, Vibration Source Levels for Construction Equipment**, lists vibration source levels for construction equipment.

Table 4.7-6
Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB			
	50 Feet	100 Feet	250 Feet	500 Feet
Pile Driver (vibratory)	87	81	74	65
Large Bulldozer	81	75	56	48
Loaded trucks	80	74	56	47
Jackhammer	73	67	49	40
Small Bulldozer	52	46	28	19

Source: Federal Railroad Administration, 2005.

As indicated in **Table 4.7-6**, 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. The closest existing use where vibration levels could be experienced by a sensitive interior use is Glendale Memorial Hospital, which is located approximately 570 feet northeast of the project site. Although CEQA requires a comparison between the project and conditions as they currently exist, in this case, the nearby Glendale Triangle project is also being considered in the analysis. The Glendale Triangle project is currently under construction and could be occupied with residential uses by the time construction begins on the proposed project. The Glendale Triangle project is located approximately 100 feet from the property line of the project site. Vibration at the future mixed-use residential project adjacent to the project site would be above the 72 VdB threshold for residences and buildings where people normally sleep during short-term construction activities, depending on the equipment in use. Groundborne vibration generated from the construction of the proposed project at these receptor locations would significant.

Development Options

Construction activity would remain the same under each of the development options. Therefore, no additional impacts would occur.

Level of Significance Before Mitigation: Significant

Mitigation Measures: The following mitigation measures are provided to minimize ground vibration impacts associated construction:

4.7-1 The applicant shall provide notification to adjacent residences at least 10 days in advance of construction activities that are anticipated to result in vibration levels above the thresholds.

4.7-2 Prior to issuance of a demolition permit, the applicant shall submit a construction plan to the City for review and approval. The construction plan shall include phases of construction, anticipated equipment, and timetables for each phase/equipment type. The following features shall be included in the construction plan:

- Demolition, earthmoving, and ground-impacting operations shall be conducted so as not to occur in the same period.
- Demolition methods shall minimize vibration, where possible (e.g., sawing masonry into sections rather than demolishing it by pavement breakers).
- Earthmoving equipment on the construction site shall be operated as far away from vibration sensitive sites as possible.

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

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

The construction period for the proposed project is anticipated to consist of three phases and last approximately 24 months. Phase I (Demolition) would involve the demolition of approximately 39,341 square feet of existing commercial/industrial uses and associated surface parking lots. Based upon a conservative estimate, it is anticipated that demolition would occur over a three-week period and involve the use of standard construction equipment such as bulldozers, loaders and haul trucks. Approximately 3,544 cubic yards of demolition material would be generated.

Phase II (Grading and Excavation) would involve the excavation of existing fill materials and replacement with properly compacted fill materials. This phase would occur over an estimated three months. Grading would require excavation to a depth of 22 feet below the ground surface. The amount of earth materials anticipated to be exported from the project site would be approximately 31,096 cubic yards. Grading activities would involve the use of standard earth moving equipment, such as dozers, loaders, excavators and dump trucks, and other related heavy-duty equipment, which would be stored on-site during construction to minimize disruption of the surrounding land uses.

Phase III would consist of sub- and above-grade construction, which would occur over a 20-month period. Building activities during building construction would involve the use of standard construction equipment, including cranes, forklifts, concrete mixers and pumps, air compressors, generators, skill saws, and power drills. A total of 10 to 20 material delivery trucks per day are anticipated during the peak period of these phases of construction.

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, as well as residents immediately east and surrounding the project site. The US Environmental Protection Agency (US EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. This data is presented in **Figure 4.7-5, Noise Levels of Typical Construction Equipment**. As shown, noise levels generated by heavy equipment can range from approximately 68 dB(A) to noise levels in excess of 95 dB(A) when measured at 50 feet.

Construction activities associated with the proposed project would be located approximately 100 feet from the residential mixed-use project that is expected to be complete, and may be occupied, when the proposed project is under construction. Noise levels generated during each of the project phases are presented in **Table 4.7-7, 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) as allowed by the Municipal Code.

Table 4.7-7
Estimated Noise Levels for Construction Phases

	Approximate Leq (dB(A)) without Noise Attenuation			
Construction Phase	**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 4.7**.*

In addition to 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.

Development Options

Construction activity associated with each of the development options would be similar and would be expected to exceed the City's noise threshold of 65 dB(A) as allowed by the Municipal Code. Therefore, impacts would be significant.

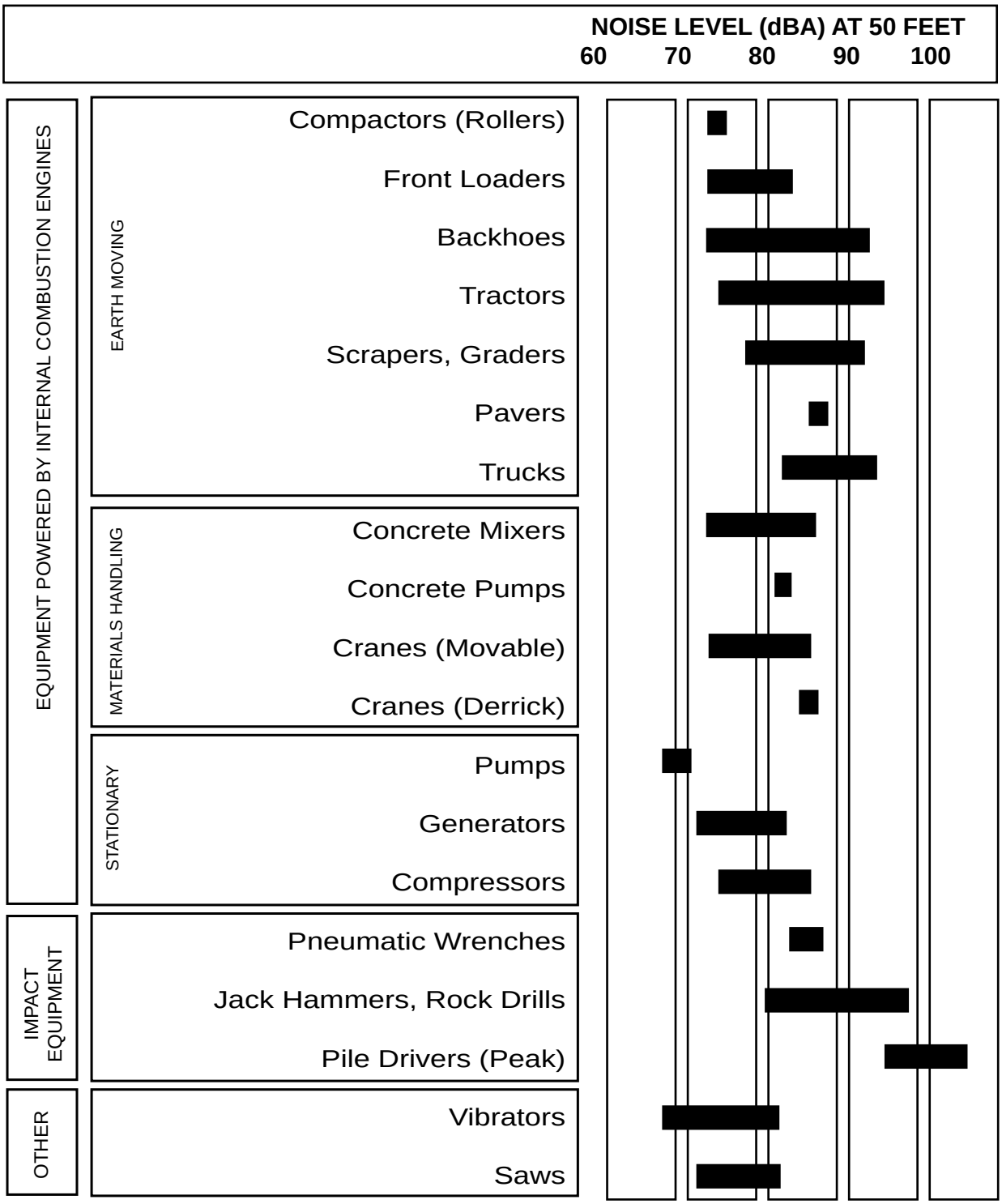
Level of Significance Before Mitigation: Significant.

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

4.7-3 All construction activity within the City of Glendale shall be conducted in accordance with Section 8.36.080 of the City of Glendale Municipal Code.

4.7-4 The project applicant shall require through 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;
- Schedule high noise-producing activities between the hours of 8:00 AM and 5:00 PM to minimize disruption on sensitive uses;



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 **4.7-5**

Noise Levels of Typical Construction Equipment

- 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 of Glendale 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 of Glendale prior to issuance of a grading permit.

4.7-5 The project applicant shall require through 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 of Glendale prior to issuance of a grading permit.

4.7-6 The project applicant shall require through 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 of Glendale prior to issuance of a grading permit.

Level of Significance After Mitigation: The mitigation measures provided above would reduce construction noise impacts, but intermittent and temporary increases in the ambient noise level in the project vicinity would nevertheless occur with the implementation of all feasible mitigation measures. Impacts during construction would remain significant and unavoidable for the proposed project and all development options.

Cumulative Impacts

For purposes of this analysis, development of the related projects provided in **Table 4.0-1, List of Related Projects**, in **Section 4.0, Environmental Impact Analysis**, would 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?

Related 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). The proposed project would also be designed to meet these standards. No significant cumulative impact on interior noise levels for sensitive uses in the area will occur.

Cumulative development in the downtown area will also not result in a significant cumulative impact in traffic noise levels. 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 proposed project would result in a cumulatively significant impact, the increase between existing conditions and future with proposed project conditions was determined. Refer to **Table 4.7-8, Cumulative Roadway Noise Levels**. As shown, no increase above 1.4 dB(A) CNEL is anticipated. Additionally, In addition, the noise level on all streets analyzed would be less than 65 dB(A), which is below the City of Glendale Municipal Code exterior noise threshold of 65 dB(A) for residential uses.

With regard to stationary sources, related development in the project vicinity will introduce additional sources of noise such as rooftop equipment, loading docks, and parking structures. Since these related 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.

Table 4.7-8
Cumulative Roadway Noise Levels

Roadway Segment	Existing	Future With Project	Cumulative Change in Noise Levels	Future With Option 2	Cumulative Change in Noise Levels	Cumulative Project Impact
Brand Boulevard						
North of San Fernando Road	62.7	63.4	0.7	63.4	0.7	No
South of San Fernando Road	63.0	63.6	0.6	63.6	0.6	No
San Fernando Road						
North of Los Feliz Boulevard	62.7	63.1	0.4	63.1	0.4	No
Between Los Feliz Boulevard and Central Avenue	61.3	61.7	0.4	61.7	0.4	No
Between Central Avenue and Brand Boulevard	64.3	64.8	0.5	64.8	0.5	No
East of Brand Boulevard	62.8	63.4	0.6	63.4	0.6	No
Central Avenue						
North of Los Feliz Boulevard	60.5	61.8	1.3	61.8	1.3	No
Between Los Feliz Boulevard and San Fernando Road	58.1	59.4	1.3	59.4	1.3	No
South of San Fernando Road	52.2	53.6	1.4	53.6	1.4	No
Gardena Avenue						
North of Los Feliz Boulevard	52.8	53.3	0.5	53.3	0.5	No
South of Los Feliz Boulevard	53.0	53.3	0.3	53.3	0.3	No

Source: Impact Sciences, Inc. Model results are contained in ***Appendix 4.7****.*

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?**

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. The adjacent Glendale Triangle Project is currently under construction and, depending on the construction schedule for that project, could coincide with vibration-generating activities at the project site. However, demolition and grading activities have commenced at the Glendale Triangle project site, and, since the construction activities that generate vibration are associated primarily with the early stages of construction, a cumulative vibration impact is considered unlikely to occur. As the related projects would occur in various locations and at different times, none of the related projects is expected to cause significant vibration impacts from concurrent construction activities. The cumulative impact of the proposed project and related projects would be less than significant, and the proposed project's contribution to the impact would not be cumulatively considerable. Therefore, the cumulative impact of the proposed project would 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 a substantial temporary or periodic increase in ambient noise levels in the project and related project site vicinities above levels existing without the proposed project and related project?**

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 adjacent Glendale Triangle Project is currently under construction and, depending on the construction schedule for that project, could coincide with noise-generating activities at the project site. However, demolition and grading activities have commenced at the Glendale Triangle project site, and the construction schedules for the two projects are unlikely to

significant overlap. Furthermore, construction activities at the Glendale Triangle project site are subject to mitigation measures similar to those provided above for the proposed project, which are intended to reduce temporary construction noise impacts to the degree feasible.

None of the other related projects would be located close enough to the project site where significant noise impacts would occur from concurrent construction activities. The cumulative impact of the proposed project and related projects would be less than significant, and the proposed project's contribution to the impact would not be cumulatively considerable. Therefore, the cumulative impact of the proposed project would 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