IV.H. NOISE

ENVIRONMENTAL SETTING

Noise is commonly defined as unwanted sound. Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound can be characterized by a variety of parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The unit of sound pressure ratioed to an assumed zero sound level is called a decibel (dB).

Because sound or noise can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale similar to the Richter Scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called "A-weighting", written as dB(A). Any further reference to decibels in this discussion written as "dB" should be understood to be A-weighted.

Noise sources are either point sources, such as stationary equipment, or line sources, such as freeways with numerous point sources (motor vehicles). Noise attenuation, or the reduction in perceived noise level, occurs at different rates for point and line noise sources. Noise resulting from point sources typically attenuates at a rate of 6 dB for a doubling of distance from the source to the receptor. For example, a 60 dB(A) noise level measured at 50 feet from a point source would be approximately 54 dB(A) at 100 feet. Sound generated by a line source typically attenuates at a rate of 3 dB per doubling of distance. Sound levels can also be attenuated by man-made or natural barriers. Solid walls, berms, or elevation differences typically reduce noise levels by 5 to 10 dB. Sound levels for a source may also be attenuated 3 to 5 dB by a first row of houses and 1.5 dB for each additional row of houses. The minimum noise attenuation provided by typical structures in California is provided in Table IV.H-1.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or, alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). An interior CNEL of 45 dB(A) is mandated for multiple family dwellings in Title 24 of the California Code of Regulations, and is considered a desirable noise exposure for single-family dwelling units as well. Since typical noise attenuation within residential structures is approximately 25 dB, an exterior noise

exposure of 60-65 dB CNEL is generally the noise/ land use compatibility guideline for new residential dwellings in California.[1]

Table IV. H-1
Structural Noise Attenuation in California

Structural/Land Use Type	Noise Attenuation – dB(A)	
	Open Windows	Closed Windows
Residential	12	25
Schools	12	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	20	30
Theaters	17	25
Hotels/Motels	17	25
Source: Highway Noise Fundamentals, p. 117.		

The City of Los Angeles is the local agency responsible for adopting and implementing policies as they relate to noise levels and its affect on land uses within its jurisdiction. Both acceptable and unacceptable noise levels associated with construction activities, roadway noise levels and ambient noise levels must all be defined and quantified. The City of Los Angeles has numerous ordinances and enforcement practices that apply to intrusive noise as well as ones that guide new construction. The City's comprehensive noise ordinance (Section 111 et seq. of the Los Angeles Municipal Code) establishes sound measurement and criteria, maximum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses, hours of operation for certain uses, standards for determining when noise is deemed a disturbance to the peace, and legal remedies for violations. The standards are correlated with land use zoning classifications in order to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. Table IV. H-2 below shows the noise/land use compatibility guideline for land uses within the City of Los Angeles.

In the Noise Element of the City of Los Angeles General Plan, a 60 dB CNEL exposure is considered the most desirable target for the exterior of noise sensitive land uses, or sensitive receptors, such as homes, schools, churches, libraries, etc. It is also recognized that such a level may not always be possible in areas of substantial traffic noise intrusion. Exposures up to 70 dB CNEL for noise-sensitive

1 *Noise Exposure Guidelines, State of California, Department of Health Services, Environmental Health Division*

uses are considered conditionally acceptable if all measures to reduce such exposure have been taken. Noise levels above 70 dB CNEL are normally unacceptable except in unusual circumstances.

New noise-sensitive land uses are generally not approved for noise environments exceeding 65 dB CNEL unless the noise exposure of any usable exterior space can be mitigated to below 65 dB CNEL[2] In many older residential areas, especially near freeways, noise levels in excess of 65 dB CNEL are common.

Table IV. H-2
Community Noise Exposure CNEL

Land Use	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Single-family, Duplex, Mobile Homes	50 - 60	55 - 70	70 - 75	above 70
Multi-Family Homes	50 - 65	60 - 70	70 - 75	above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 - 70	60 - 70	70 - 80	above 80
Transient Lodging – Motels, Hotels	50 - 65	60 - 70	70 - 80	above 80
Auditoriums, Concert Halls, Amphitheaters	---	50 - 70	---	above 65
Sports Arena, Outdoor Spectator Sports	---	50 - 75	---	above 70
Playgrounds, Neighborhood Parks	50 - 70	---	67 - 75	above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 - 75	---	70 - 80	above 80
Office Buildings, Business and Professional Commercial	50 - 70	67 - 77	above 75	---
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	---

[1]Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
[2]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.
[3]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.
[4]Clearly Unacceptable: New construction or development should generally not be undertaken.
Source: Office of Noise Control, California Department of Health Services (DHS)

[2] *California Housing and Urban Development (HUD) Guidelines.*

Fundamentals of Environmental Groundborne Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured as particle velocity in inches per second and, in the U.S., is referenced as vibration decibels (VdB).

The background vibration velocity level in residential areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level 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 rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. The general human response to different levels of groundborne vibration velocity levels is described in Table IV.H-3.

Table IV.H-3
Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.
Source: Federal Railroad Administration 1998	

Existing Ambient Daytime Noise Levels

Existing ambient daytime noise levels were measured at three selected locations around the project site on January 21, 2004. These locations are identified in Figure IV.H-1. The noise levels were measured using a Larson-Davis Model 820 precision sound level meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. The average noise levels and sources of noise measured at each location are identified in Table IV.H-4. These daytime noise levels are characteristic of an urban environment.

Insert Figure IV.H-1 Noise Measurement Locations

Table IV.H-4
Existing Daytime Noise Levels at Selected Locations

Noise Measurement Location	Primary Noise Sources	Noise Level Statistics		
		L_{eq}	L_{min}	L_{max}
1. Magnolia Boulevard; across from proposed project site.	Traffic on I-405	62.7	58.4	68.9
2. Near eastern boundary of proposed project site.	Traffic on I-405	60.0	56.2	64.8
3. Near western boundary of proposed project site.	Traffic on I-405	61.2	57.4	67.1
Source: Christopher A. Joseph & Associates, 2004.				

Land uses in the vicinity of the project site include commercial, institutional, industrial, and residential uses. Residential units are located to the north and east of the proposed project site along Magnolia Boulevard and across Sepulveda Boulevard. The existing Teichman Family Torah Center is located at the terminus of Magnolia Boulevard, approximately 100 feet west of the proposed project site.

Existing 24-hour noise levels have been calculated for the various roadways adjacent to the project site. These noise levels are presented in Table IV.H-5.

Table IV.H-5
Existing Roadway Noise Levels On-Site

Roadway	Roadway Segment	Land Uses	dBA L_{eq}
Magnolia Boulevard	West of Sepulveda Boulevard	Residential	60.1
Source: Christopher A. Joseph & Associates, 2004. Calculation data and results are provided in Appendix J.			

Existing roadway noise levels were also calculated for the roadway links in the project vicinity that have noise sensitive uses facing the roadways. The average daily noise levels along these roadway segments are presented in Table IV.H-6.

Table IV.H-6
Existing Roadway Noise Levels Off-Site

Roadway	Roadway Segment	Land Uses	dBA L_{eq}
1. Sepulveda Boulevard	North of Ventura Boulevard	Residential	70.8
2. Sepulveda Boulevard	South of Magnolia Boulevard	Residential	71.3
3. Sepulveda Boulevard	North of Magnolia Boulevard	Residential	71.3

4. Magnolia Boulevard	East of Sepulveda Boulevard	Residential	60.3
5. Magnolia Boulevard	West of Sepulveda Boulevard	Residential	60.1
6. Sepulveda Boulevard	South of Burbank Boulevard	Residential	70.9
7. Sepulveda Boulevard	North of Burbank Boulevard	Residential	70.7
8. Burbank Boulevard	East of Sepulveda Boulevard	Residential	71.5
9. Burbank Boulevard	West of Sepulveda Boulevard	Residential	72.8
***Source**: Christopher A. Joseph & Associates, 2004. Calculation data and results are provided in Appendix J.*			

Existing Groundborne Vibration

Aside from seismic events, the greatest regular sources of groundborne vibration at the proposed site and immediate vicinity are roadway truck and bus traffic. These trucks and buses typically generate groundborne vibration velocity levels of around 63 VdB. These levels could reach 72 VdB where trucks and buses pass over bumps in the road.

REGULATORY SETTING

Federal

The Federal Railway Administration has developed vibration impact thresholds for sensitive buildings, residences, and institutional land uses. These thresholds are 80 VdB at residences and buildings where people normally sleep (e.g., nearby residences) and 83 VdB at institutional buildings.

State

Title 24 of the California Code of Regulations codifies Sound Transmission Control requirements, which establishes uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family dwellings. Specifically, Title 24 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA L_{eq} in any habitable room of new multi-family dwellings. Dwellings are to be designed so that interior noise levels will meet this standard for at least 10 years from the time of building permit application.

ENVIRONMENTAL IMPACTS

Thresholds of Significance

Based on criteria established in the City of Los Angeles CEQA Threshold Guide (2001), the standards listed below are used for determining noise construction and operational impacts.

Construction Noise

A project would normally have a significant impact on noise levels from construction if:

- Construction activities lasting more than one day would exceed ambient exterior noise levels by 10 dBA or more at a noise sensitive use;
- Construction activities lasting more than 10 days in a three month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use; or
- Construction activities would exceed the ambient noise level by 5dBA at a noise sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or at anytime on Sunday.

Section 112.05 of the Los Angeles Municipal Code specifies the maximum noise level of powered equipment or powered hand tools. Any powered equipment or powered hand tool that produces a maximum noise level exceeding 75 dB(A) at a distance of 50 feet from construction and industrial machinery is prohibited. However, the above noise limitation does not apply where compliance is technically infeasible (Section 112.05, Los Angeles Municipal Code). Technically infeasible means that the above noise limitation cannot be complied with despite the use of mufflers, shields, sound barriers and/or any other noise reduction device or techniques during the operation of the equipment. An inability to reduce construction equipment noise exposure to 75 dB(A) or less at any off-site, noise-sensitive use would be considered a significant temporary noise impact.

Operational Noise

A project would normally have a significant impact on noise levels from project operations if the project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, as defined in Table IV. H-2.

Project impacts

Demolition/Construction Noise Impacts.

Development of the proposed project requires demolition of the existing on-site structures, site preparation, construction as well as cleanup. These activities typically involve the use of heavy equipment, such as scrapers, tractors, loaders and concrete mixers. Trucks would be used to deliver equipment and building materials, and to haul away waste materials. Smaller equipment, such as jackhammers, pneumatic tools, saws and hammers would also be used throughout the site during its

development. This equipment would generate both steady state and episodic noise that would be heard both on and off the project site. It should be noted that the nearest sensitive receptors, which would experience the highest noise levels, are approximately 30 feet to the east of the site.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise-generating characteristics of specific types of construction equipment, which are presented in Figure IV. H-2. Noise levels generated by heavy equipment can range from approximately 68 dB to levels in excess of 100 dB when measured at 50 feet. Construction noise exposure can be further increased if several pieces of equipment operate in close proximity. Due to the logarithmic nature of decibel addition, two equally loud pieces of equipment will be perceived as 3 dB louder than either one individually. Three simultaneous sources result in a 5 dB increase over any single source. Thus, while average operational equipment noise levels are perhaps 5 dB less than at peak power, simultaneous equipment operation can still yield an apparent noise strength equal to any individual source at peak noise output. Whereas the average heavy equipment reference noise level is 85 dB, short-term levels from either peak power or from several pieces operating in close proximity can be as high as 90 dB. While noise levels can be increased due to simultaneous operation, noise levels diminish with regards to distance from the construction site at a rate of approximately 6 dB per doubling of distance.[3] As an example, 68 dB measured at 50 feet from the noise source to the receptor would be reduced to 62 dB at 100 feet from the source to the receptor, and would be further reduced by another 6 dB to 56 dB at 200 feet from the source to the receptor. Additionally, noise levels are further reduced from these values as physical structures built during construction break the line-of-sight, which in turn reduces the observed noise level during later phases of construction involving the building construction. However, as a basis for this analysis, the 89 dB at 50 feet value is used as the maximum assumed construction noise level.

Noise levels generated during the construction phase would affect residents to the north, east and south. The nearest sensitive receptors, which would experience the highest noise levels, are approximately 30 feet to the east of the site. It should be noted that heavy equipment, such as scrappers and graders that represent the loudest sources of noise, would affect sensitive receptors the greatest while operating in proximity to the uses. Construction noise at the adjacent sensitive receptors could be as great as 90 dB(A) during the most intense construction activities. As previously explained, the City's comprehensive noise ordinance (Section 111 et seq. of the LAMC) establishes sound measurement and criteria, maximum ambient noise levels for different land use zoning classifications. For multi-family

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[3] *The City of L.A. CEQA Thresholds Guide references drop-off rates of 3 dBA over acoustically hard surfaces, and 4.5 dBA over irregular soft ground. These rates apply to line sources (roadways), but not to spherically spreading point radiators such as individual pieces of construction equipment. The 6 dB distance doubling factor is a standard assumption in noise propagation theory for isolated point sources of sound waves.*

Figure IV.H-2 Typical Construction Equipment Noise Generation Levels

residences, noise levels of 60 to 70 dB(A) CNEL is considered conditionally acceptable if all measures to reduce such exposure have been taken (refer to Table IV.H-2).

Typical construction equipment noise generation levels exceed 70 dB(A) (refer to Figure IV.H-1). The nearest noise sensitive receptors are the existing multi-family residential buildings located to the west, north and east of the proposed project site. These residential buildings directly abut the property lines of the proposed project. Construction activities would generate noise levels of up to 89 dBA Leq at these residential units during ground excavation and grading. In addition, the Teichman Family Torah Center is located approximately 100 feet from the proposed project; construction activities would generate noise levels of up to 83 dBA Leq at these residential units during ground excavation and grading. Consequently, the 75 dB equipment noise threshold, as explained in the construction noise threshold section, may be intermittently exceeded. Furthermore, during these heavy equipment operations, the distance buffer needed to reduce all maximum equipment noise to no more than the 75 dB limit does not exist. Given that construction noise would result in a substantial short-term increase greater 5 dB(A) over ambient levels, temporary significant construction noise impacts would occur intermittently throughout construction activities.

Operational Traffic Noise Impacts.

As discussed earlier, the project site and surrounding uses are compatible from a land use perspective. Additionally, given the data provided in the traffic study, the local roadway network affecting the project site and adjacent sensitive receptors would not result in any noticeable increase in vehicular volumes. Consequently, development of the proposed project would not result in the introduction of an incompatible land use that would either subject the surrounding residential uses to unacceptable noises, nor would it be subjected to unacceptable noises. Long-term noise concerns from the increased development intensity of the project site have the potential to affect off-site locations, relative to the City of Los Angeles CEQA threshold significance criteria, resulting primarily from mobile source noise along affected roadway segment analyzed in the project traffic study. These concerns were addressed using the FHWA Highway Traffic Noise Prediction Model (Stamina 2.0) which calculates the CNEL noise level for a particular reference set of input conditions, based on site-specific traffic volumes, distances, speeds and/or noise barriers. Based on the traffic report prepared for the proposed project in conjunction with the surrounding land uses, roadway noise levels were forecasted to determine if the increase in vehicular traffic would result in a significant impact at off site sensitive receptor locations.

Off-site locations in the vicinity would experience increased noise caused by traffic generated by the proposed Project. The increases in noise levels at noise-sensitive locations along the study-area roadway segments are identified in Table IV. H-7. As shown, the proposed Project would increase local noise levels by a maximum of 1.1 dBA L_{eq}. Because this is below the 3.0 dBA threshold, this impact would be less than significant.

Table IV.H-7
Project Traffic Noise Impacts

Roadway	Roadway Segment	Noise Levels in dBA L_{eq}			
		Existing	Future Plus Project Traffic	Increase	Significance Threshold
1. Sepulveda Boulevard	North of Ventura Boulevard	70.8	71.9	1.1	3.0
2. Sepulveda Boulevard	South of Magnolia Boulevard	71.3	71.6	0.3	3.0
3. Sepulveda Boulevard	North of Magnolia Boulevard	71.3	71.5	0.2	3.0
4. Magnolia Boulevard	East of Sepulveda Boulevard	60.3	60.4	0.1	3.0
5. Magnolia Boulevard	West of Sepulveda Boulevard	60.1	60.7	0.6	3.0
6. Sepulveda Boulevard	South of Burbank Boulevard	70.9	71.1	0.2	3.0
7. Sepulveda Boulevard	North of Burbank Boulevard	70.7	70.9	0.2	3.0
8. Burbank Boulevard	East of Sepulveda Boulevard	71.5	71.7	0.2	3.0
9. Burbank Boulevard	West of Sepulveda Boulevard	72.8	73.0	0.2	3.0

Source: Christopher A. Joseph and Associates, 2004. Calculation data and results are provided in Appendix J.

CUMULATIVE IMPACTS

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and other projects within the study area. Therefore, cumulative traffic-generated noise impacts have been assessed based on the contribution of the proposed project to the future cumulative base traffic volumes in the project vicinity. The noise levels associated with existing traffic volumes, cumulative base traffic volumes without the project, and cumulative base traffic volumes with the project are identified in Table IV.H-8 along with the contribution of traffic noise generated by the specific plan.

Table IV.H-8
Cumulative Project Roadway Traffic Noise Impacts

Roadway	Roadway Segment	Noise Levels in dBA L_{eq}					
		Existing Traffic Volumes	Cumulative Base Traffic	Cumulative + Project Traffic	Cumulative Increase	Project Contribution	Significance Threshold
1. Sepulveda Boulevard	North of Ventura Boulevard	70.8	73.0	71.9	2.2	1.1	3.0
2. Sepulveda Boulevard	South of Magnolia Boulevard	71.3	71.5	71.6	0.2	0.3	3.0
3. Sepulveda Boulevard	North of Magnolia Boulevard	71.3	71.5	71.5	0.2	0.2	3.0
4. Magnolia Boulevard	East of Sepulveda Boulevard	60.3	60.4	60.4	0.1	0.1	3.0
5. Magnolia Boulevard	West of Sepulveda Boulevard	60.1	60.2	60.7	0.1	0.6	3.0
6. Sepulveda Boulevard	South of Burbank Boulevard	70.9	71.0	71.1	0.1	0.2	3.0
7. Sepulveda Boulevard	North of Burbank Boulevard	70.7	70.9	70.9	0.2	0.2	3.0
8. Burbank Boulevard	East of Sepulveda Boulevard	71.5	71.7	71.7	0.2	0.2	3.0
9. Burbank Boulevard	West of Sepulveda Boulevard	72.8	73.0	73.0	0.2	0.2	3.0

Source: Christopher A Joseph and Associates, 2004. Calculation data and results are provided in Appendix J.

As shown, cumulative development before implementation of the specific plan would result in noise level increases of 0.1 to 2.2 dBA L_{eq} along the studied roadways, with the maximum increase occurring along Sepulveda Boulevard, north of Ventura Boulevard. However, with implementation of the proposed project, in addition to cumulative development, the proposed project would contribute from

0.1 dBA to 1.1 dBA to ambient noise levels. Therefore, the 0.1 dBA to 1.1 dBA contribution of the proposed project to future roadway noise levels would not exceed the identified thresholds of significance and, therefore, would not be cumulatively considerable.

MITIGATION MEASURES

Code Required

On-site construction activities would result in significant temporary noise impact at the nearest sensitive receptors due to heavy equipment operations. Standard noise abatement conditions will be required by the City of Los Angeles as part of any grading/construction permits. These measures include:

1. The project shall comply with the City of Los Angeles Noise Ordinances Nos. 144,331 and 161,574, and any subsequent ordinances which prohibit the emission or creation of noise beyond certain levels at adjacent uses unless technically infeasible.

2. Construction shall be restricted to the hours of 7:00 A.M. to 6:00 P.M., Monday through Friday, and 8:00 A.M. to 6:00 P.M. on Saturday.

3. The project contractor shall use power construction equipment with state-of-the-art noise shielding and muffling devices, where feasible.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

With respect to construction noise impacts, even with the implementation of the identified mitigation measures, short-term construction noise impacts would remain unavoidably significant during high noise level events.

Operational noise impacts would be less than significant.