
IV. ENVIRONMENTAL IMPACT ANALYSIS

K. NOISE

ENVIRONMENTAL SETTING

Characteristics of Sound

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The “A-weighted scale,” abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA.

Definitions

This noise analysis discusses sound levels in terms of Community Noise Equivalent Level (CNEL) and Equivalent Noise Level (Leq).

Community Noise Equivalent Level. CNEL is an average sound level during a 24-hour day. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually five decibels higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m., and 10 dBA to sound levels in the night before 7:00 a.m. and after 10:00 p.m. Because CNEL accounts for human sensitivity to sound, the CNEL 24-hour figure is always a higher number than the actual 24-hour average.

Equivalent Noise Level. Leq is the average noise level on an energy basis for any specific time period. The Leq for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. Leq can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

Effects of Noise

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment range from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response

include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level is approximately three decibels. A change of at least five decibels would be noticeable and could evoke a negative reaction. A ten decibel increase is subjectively heard as approximately a doubling in loudness and would most certainly cause a negative reaction.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” will decrease by approximately six decibels over hard surfaces and nine decibels over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on.

Existing Noise Setting

Within the City of El Segundo, vehicular traffic is the primary source of noise and is the largest consistently present noise source. Another significant noise source is the Los Angeles International Airport, located on the northern boundary of the City.

Sensitive Receptors

Land uses that are considered sensitive to noise impacts are referred to as “sensitive receptors.” Sensitive receptors located throughout and immediately adjacent to the City of El Segundo include: the residential neighborhoods located in the northwestern quadrant of the City which also include park and school areas; residential communities of Del Aire and Hollyglen located east of the City, within unincorporated Los Angeles County and the City of Hawthorne, respectively, and also include park and school areas; and the residential communities of the City of Manhattan Beach located southwest of the City.

Vehicular Traffic

As stated earlier, vehicular traffic is the predominant source of noise in the City. Using existing traffic volumes provided by the project traffic consultant and Federal Highway Administration (FHWA) RD-77-108 noise calculation formulas, an existing CNEL was calculated (Table IV.K-1) for six roadway segments located adjacent to sensitive receptors (i.e., residential neighborhoods) and one roadway segment (Sepulveda Boulevard south of Imperial Highway) that represents the segment with the highest traffic volume in the City. The existing CNEL is used as a baseline to measure the potential operational noise impacts that would result from the operation of the proposed Circulation Element Update roadway system. The estimated noise levels represent the most conservative scenario, which assumes that no shielding is provided between the roadway and the location of sensitive receptors.

Moreover, the noise levels shown in Table IV.K-1 represent noise levels at 50 feet from the roadway centerline. To the extent that sensitive receptors are located more than 50 feet from the roadway, noise levels experienced within these areas would be lower¹. The roadway segments used in this analysis were (see Figure IV.K-1):

- Imperial Highway East of Vista Del Mar (El Segundo residential areas)
- Grand Avenue East of Vista Del Mar (El Segundo residential areas)
- Rosecrans Avenue East of Vista Del Mar (Manhattan Beach residential area)
- Aviation Boulevard South of Imperial Highway (Del Aire [unincorporated Los Angeles County] residential area)
- Aviation Boulevard South of El Segundo Boulevard (Hollyglen [Hawthorne] residential area)
- Aviation Boulevard North of Rosecrans Avenue (Hollyglen [Hawthorne] residential area)
- Sepulveda Boulevard South of Imperial Highway

**Table IV.K-1
Existing Community Equivalent Noise Levels (CNEL)**

Location	Sound Level at 50 feet (dBA, CNEL)
Imperial Highway East of Vista Del Mar	76.2
Grand Avenue East of Vista Del Mar	61.5
Rosecrans Avenue East of Vista Del Mar	70.8
Aviation Boulevard South of Imperial Highway	73.0
Aviation Boulevard South of El Segundo Boulevard	73.6
Aviation Boulevard North of Rosecrans Avenue	74.1
Sepulveda Boulevard South of Imperial Highway	76.6
<i>Source: Christopher A Joseph & Associates</i>	

¹ *To the extent that a sensitive receptor is located closer than 50 feet from the centerline of the roadway, the actual noise level that would be experienced would be slightly higher. However, the relative difference in noise levels, which is the basis for determining potential environmental effects related to traffic noise, would be the same as indicated in the discussion of Environmental Impacts below.*

Figure IV.K-1 Roadway Noise Analysis Locations

ENVIRONMENTAL IMPACTS

Threshold of Significance

Criteria for determining the significance of impacts were obtained from the City of El Segundo Noise Ordinance. The criteria listed below were used to determine whether potential noise impacts associated with the proposed project would be significant. Significance criteria for noise include determinations for temporary construction, type of land use, and vehicular traffic. The significance criteria are discussed below.

Construction Phase Significance Criteria

A significant construction noise impact would occur if construction activity associated with the proposed Circulation Element Update would result in temporary construction noise levels that exceed 65 dBA at a sensitive receptor (City of El Segundo Noise Ordinance, Section 7-2-10). If the existing ambient sound level at the sensitive receptor location is 65 dBA or more, then an incremental increase of 5 dBA over the existing ambient sound level would be significant.

Operational Phase Significance Criteria

The proposed Circulation Element Update would result in a significant impact if the operation of the roadway system that would result from implementation of the proposed Circulation Element Update would cause noise levels to increase by five decibels or more above the ambient noise level (City of El Segundo Noise Ordinance, Section 7-2-4).

Project Impacts

Construction Noise

Construction activity could potentially be associated with implementation of the proposed Circulation Element Update. This activity would be undertaken in conjunction with construction of roadway improvements on the Rosecrans/Sepulveda site and with construction of intersection improvements identified at 14 intersections. Deletion of roadways from the Circulation Element roadway network would have no construction noise impacts as no construction activity would be associated with this component of the proposed Circulation Element Update. Conversion of Nash and Douglas Streets from one-way to two-way operation would involve restriping and reconfiguration within the existing right-of-way to provide for the movement of two-way traffic at existing intersections on these streets and would involve minimal construction activity. Construction noise impacts of this component of the proposed Circulation Element Update would be less than significant.

Temporary construction noise impacts associated with the remaining activities associated with implementation of the proposed Circulation Element Update would be expected to vary throughout the construction period because the noise level of construction equipment ranges widely as a function of the

quantity and type of equipment used (see Table IV.K-2). Additionally, construction noise tends to vary over time, corresponding to the various discrete phases of the construction program, typically starting with site clearance, followed by rough grading and trenching for utilities, finish grading, and concrete pouring and completion of roadways (see Table IV.K-3).

As shown in Table IV.K-1 above, ambient noise levels associated with the roadways adjacent to residential areas range from 61.5 dBA to 76.2 dBA. Projected noise levels resulting from the employment of construction equipment during various phases of the construction cycle, as shown in Tables IV.K-2 and IV.K-3, would result in generation of noise levels in excess of 65 dBA and would have the potential to exceed existing ambient noise levels at sensitive receptors by greater than 5 dBA when sensitive receptors are located within 50 feet of a potential construction site. Receptors further than 50 ft. from the construction areas may experience lower noise levels than stated in Table IV.K-3. However, such locations could experience an increase of 5 dBA over the existing ambient levels as a result of construction activities.

These resulting noise levels during construction activity could be experienced in the vicinity of the Rosecrans/Sepulveda site and at the following intersections where identified intersection improvements could be constructed near residential areas:

- Aviation Boulevard/El Segundo Boulevard
- Aviation Boulevard/Utah Avenue
- Aviation Boulevard/Rosecrans Avenue
- Sepulveda Boulevard/Rosecrans Avenue
- El Segundo Boulevard/Isis Avenue

Significant construction noise impacts would result from construction activities associated with implementation of the proposed Circulation Element Update at these locations. Impacts from construction activities at the remaining intersections would be less than significant as these intersections are surrounded by commercial and industrial uses (i.e., non-sensitive receptors).

Table IV.K-2
Noise Level Ranges of Typical Construction Equipment

Equipment	Noise Level (dBA) at 50 ft.*
Front Loader	73-86
Trucks	82-95
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Vibrator	68-82
Saws	72-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Back Hoe	73-95
Pile Driving (peaks)	95-107
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88
<i>Source: EPA, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, 1971.</i>	
<i>*Machinery equipped with noise control devices or other noise-reducing design features would generate noise levels approximately 5 to 10 dBA lower than shown in this table.</i>	

Table IV.K-3
Outdoor Construction Noise Levels

Construction Phase	Noise Level (dBA L_{eq}) at 50 ft.	Noise Level (dBA L_{eq}) at 50 ft. with equipment mufflers
Ground Clearing	84	82
Excavation, Grading, Utility Trenching	89	86
Concrete Pour, Roadway Construction	78	77
<i>Source: EPA, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, 1971.</i>		

Operational Noise

The predominant noise source that would be associated with the proposed Circulation Element Update, as with most urbanized areas, is vehicular traffic. Utilizing Federal Highway Administration (FHWA) RD77108 noise calculation formulas, an analysis of the noise levels that would result from the operation

of the proposed Circulation Element Update roadway system under future traffic conditions was conducted. This analysis used predicted traffic volumes and operational characteristics of the Circulation Element Update roadway system to estimate future noise levels. Based on daily traffic volumes, the CNEL was calculated for the seven roadway segments analyzed (see Table IV.K-4).

Table IV.K-4
Future Estimated Community Equivalent Noise Levels
Sound Level at 50 feet (dBA, CNEL)

Location	Existing	Future (2025)	Change
Imperial Highway East of Vista Del Mar	76.2	76.6	0.4
Grand Avenue East of Vista Del Mar	61.5	63.8	2.3
Rosecrans Avenue East of Vista Del Mar	70.8	72.1	1.3
Aviation Boulevard South of Imperial Highway	73.0	76.5	3.5
Aviation Boulevard South of El Segundo Boulevard	73.6	75.5	1.9
Aviation Boulevard North of Rosecrans Avenue	74.1	75.2	1.1
Sepulveda Boulevard South of Imperial Highway	76.6	77.2	0.6
<i>Source: Christopher A Joseph & Associates</i>			

As shown in Table IV.K-4, the increase in projected noise levels on the proposed Circulation Element Update roadway system would be less than audible (i.e., less than 3 dBA) on six of the seven roadway segments. The largest increase, 3.5 dBA, would occur on the segment of Aviation Boulevard located south of Imperial Highway. However, this increase would be less than the significance threshold of 5 dBA. Impacts related to vehicular noise sources resulting from implementation of the proposed Circulation Element Update would be less than significant.

CUMULATIVE IMPACTS

Noise from construction activity associated with individual roadway and intersection improvement projects under the proposed Circulation Element Update would increase community noise levels in the immediate vicinity of each individual construction site. Potential cumulative impacts with other construction activity occurring in the same area, and at the same time, as the roadway and intersection improvement projects could occur to the extent that high noise level events associated with these activities were to overlap. To the extent that this occurs, cumulative construction noise impacts would be significant.

The analysis of traffic noise impacts of the proposed Circulation Element Update considers the effects of both background growth in the region, as reflected in the SCAG regional model, and within the City, in accordance with the existing land use designations of the City's General Plan. Consequently, impacts of cumulative growth are already incorporated into the 2025 traffic projections utilized to model the future noise levels shown in Table IV.K-4 above. As indicated, noise impacts of cumulative traffic growth within the City to 2025 would be less than significant.

SUBSEQUENT ENVIRONMENTAL DOCUMENTATION

Subsequent environmental documentation shall be prepared for roadway improvements proposed to be constructed on the Sepulveda/Rosecrans site and intersection improvements proposed to be constructed at the intersections located adjacent to residential areas, as listed above. The subsequent environmental documentation shall address the following:

- A project-specific construction noise analysis shall be prepared that calculates, based on project-specific parameters and identification of the site-specific sensitive receptors that could be affected by construction activities, the noise levels that would be experienced at sensitive receptors located adjacent to that site. If noise levels resulting from construction activity would result in temporary construction noise levels that exceed 65 dBA at a sensitive receptor, or cause an incremental increase of 5 dBA over the existing ambient sound level, if the existing ambient sound level at the sensitive receptor location is 65 dBA or more, then the study shall identify feasible mitigation measures to be applied to that roadway or intersection improvement project from the list of mitigation measures K-1 through K-4 below.

MITIGATION MEASURES

- K-1** Construction contracts shall specify that all construction equipment shall be equipped with properly working mufflers and other applicable noise attenuation devices.
- K-2** All property owners located within 400 feet of the construction site shall be sent a notice regarding the construction schedule of the proposed project. All notices shall indicate the dates and duration of construction activities, as well as provide a telephone number where residents can inquire about the construction process and register complaints.
- K-3** A “noise disturbance coordinator” position shall be established for the project. The disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad mufflers, etc.) and would be required to implement reasonable measures such that the complaint is resolved. All notices that are sent to the property owners within 400 feet of the construction site shall list the telephone number for the disturbance coordinator.
- K-4** As stated in the City of El Segundo Municipal Code, construction shall be restricted to the hours of 7:00 A.M. to 6:00 P.M. Monday through Saturday, and prohibited at anytime on Sunday or a Federal holiday.

Impacts associated with conversion of Nash and Douglas Streets from one-way to two-way operation would be less than significant. No mitigation measures are required.

Impacts related to traffic noise levels would be less than significant and no mitigation would be required.

LEVEL OF IMPACT AFTER MITIGATION

Construction Impacts

Construction noise impacts from conversion of Nash and Douglas Streets from one-way to two-way operation would be less than significant.

Implementation of mitigation measure K-1 would ensure that construction equipment be outfitted with properly working mufflers. Machines equipped with mufflers have reduced noise levels. The sound level reduction can range from one to three decibels, as shown in Table IV.K-3 above. With muffler utilization, excavating, grading and utility trenching activities would have the greatest noise impacts, producing noise levels of up to 86 dBA at a reference distance of 50 feet. Such noise levels, albeit temporary, would be greater than 65 dBA and would likely be at least 5 dBA above ambient noise levels. Thus significant and unavoidable construction noise impacts would result from construction activities associated with implementation of the proposed Circulation Element Update.

Operational Impacts

Operational traffic noise impacts would be less than significant.