5.9 NOISE

This section of the Draft Environmental Impact Report (DEIR) evaluates the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; identifies noise levels for existing conditions; and evaluates the potential noise and vibration impacts associated with buildout of the Proposed Project. The noise modeling data are included in Appendix F of this DEIR.

5.9.1 Environmental Setting

Noise Descriptors

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **g.** The quantity denoted as 'g' is the acceleration produced by the force of gravity. By international agreement, the value of 32.174 ft/sec^2 (or 980.665 cm/sec^2) has been chosen as the standard acceleration due to gravity.

- **Decibel (dB).** A unitless measure of sound on a logarithmic scale.

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}).** The mean of the noise level, energy averaged over the measurement period.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM.

Characteristics of Sound

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human,

frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA (the threshold of detection) to 140 dBA (the threshold of pain).

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 5.9-1 presents the subjective effect of changes in sound pressure levels.

Table 5.9-1 Change in Apparent Loudness

± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen, 2009.

Sound is generated from a source and the decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss or distance attenuation.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. For example, L_{50} is the noise level that is exceeded 50 percent of the time: half the time the noise exceeds this level and half the time it is less than this level. This is also the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08}, and L_{25} values are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with community noise measurements. The L_{eq} metric is a single-number noise descriptor of the energy-average sound level over a given period of time. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values are the minimum and maximum root-mean-square (RMS) noise levels obtained over the stated measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and nighttime hours, state law requires that, for planning purposes and to account for this increased receptiveness of noise, an artificial decibel increment is to be added to quiet-time noise levels to calculate the 24-hour CNEL noise metric.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-

developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance.

Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 5.9-2 shows typical noise levels from familiar sources.

Table 5.9-2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009.

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can

be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure. These types of vibration are best measured and described in terms of velocity and acceleration.

The three main types of waves associated with groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

- **Surface or Rayleigh waves** travel along the ground surface. They carry most of their energy along an expanding cylindrical wave front, similar to the ripples produced by throwing a rock into a lake. The particle motion is more or less perpendicular to the direction of propagation.

- **Compression or P-waves** are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.

- **Shear or S-waves** are also body waves, carrying their energy along an expanding spherical wave front. Unlike P-waves, however, the particle motion is transverse, or perpendicular to the direction of propagation.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or RMS velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance. Even the more persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Man-made vibration problems are, therefore, usually confined to short distances (500 to 600 feet or less) from the source (FTA 2006).

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, etc., all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions. Trains generate substantial quantities of vibration due to their engines, steel wheels, heavy loads, and wheel-rail interactions.

5.9.1.1 REGULATORY FRAMEWORK

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the State of California and the City of Long Beach have established standards and ordinances to control noise. The following discuss the noise standards applicable to the project.

State of California Noise Requirements

The state regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise insulation standards and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element, which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research. The purpose of the Noise Element is to "limit the exposure of the community to excessive noise levels."

The State Noise Compatibility Guidelines, presented in Table 5.9-3, are designed to ensure that proposed land uses are compatible with the predicted future noise environment. At different exterior noise levels, individual land uses are identified as "clearly acceptable", "normally acceptable", "normally unacceptable", or "clearly unacceptable". A "conditionally acceptable" designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a "normally acceptable" designation indicates that standard construction can occur with no special noise reduction requirements.

Table 5.9-3 Community Noise and Land Use Compatibility

Land Uses	CNEL (dBA) 55	60	65	70	75	80
Residential-Low Density Single Family, Duplex, Mobile Homes						
Residential- Multiple Family						
Transient Lodging: Hotels and Motels						
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheaters						
Sports Arena, Outdoor Spectator Sports						
Playground, Neighborhood Parks						
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Businesses, Commercial and Professional						
Industrial, Manufacturing, Utilities, Agricultural						

Explanatory Notes

	Normally Acceptable: With no special noise reduction requirements assuming standard construction.			Normally Unacceptable: New construction is discouraged. If new construction does not proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.			Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: California Office of Noise Control. *Guidelines for the Preparation and Content of Noise Elements of the General Plan.* February 1976.

In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a significant impact if the project exposes people to noise levels in excess of thresholds, which can include standards established in the local general plan or noise ordinance.

State of California Building Code

The state's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in the State for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

City of Long Beach

The Proposed Project is subject to the City's General Plan Noise Element and the Municipal Code.

Noise Element

The City's General Plan Noise Element includes an assessment of the existing community noise environment, including surveys of residents, and an action plan for achieving goals for the future noise environment within the City. It aims to protect the health and well-being of the City's residents by establishing and preserving quiet environments within the City. As no land use compatibility standards were included in the City's Noise Element, the State Noise Compatibility Guidelines (Table 5.9-3) were used to evaluate land use compatibility.

Below are the goals included in the City's Noise Element:

Goal **To attain a healthier and quieter environment for all its citizens while maintaining a reasonable level of economic progress and development.**

Goal **To protect and preserve both the property rights of owners and the right to quietness of the citizenry at large.**

Goal **To make the City a quieter, more pleasant place in which to live.**

Goal **To diminish the transportation roar that impacts on the population.**

Goal **To respond to demands for a reasonably quiet environment which is compatible with both existing ambient noise levels and continuing building and industrial development.**

Goal **To reduce both noise exposure to the population and noise level outputs generated by the population.**

Goal **To attain the lowest possible level of harmful effects of noise on the people by the implementation of information, monitoring, and advisory programs.**

The City's Noise Element also includes coordinated goals between this element and the Seismic Safety, Public Safety, Scenic Highways, Conservation, Mobility, Open Space, Housing, and Land Use Elements.

Municipal Code

Chapter 8.80 (Noise) of the Long Beach Municipal Code provides regulations to control unnecessary, excessive, and annoying noise and vibration in the City. Exterior and interior noise limits based on land use are shown in Table's 5.9-4 and 5.9-5, respectively.

Table 5.9-4 Exterior Noise Limits

Receiving Land Use District	Noise Level (dBA)	
	7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
District One	50	45
District Two	60	55
District Three[1]	65	65
District Four[1]	70	70
District Five	Regulated by other agencies and laws	

Source: Long Beach Municipal Code, Chapter 8.80 (Noise).
Notes: District One – predominantly residential with other land use types also present; District Two – predominantly commercial with other land use types also present; Districts Three and Four – predominantly industrial with other land use types also present; District Five – Airport, freeways, and waterways regulated by other agencies.
[1] Districts Three and Four limits are intended primarily for use at their boundaries rather than for noise control within those districts.

Table 5.9-5 Interior Noise Limits

Receiving Land Use District	Type of Land Use	Allowable Interior Noise Level (dBA)	
		7:00 AM – 10:00 PM	10:00 PM – 7:00 AM
All	Residential	45	35
All	School	45[1]	N/A
Hospital, designated quiet zones and noise sensitive zones		40	40

Source: Long Beach Municipal Code, Chapter 8.80 (Noise).
[1] While school is in session.

The following adjustments are applicable to the exterior standards outlined in Table 5.9-4:

If the noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the noise levels shall be reduced by 5 dBA. Noise levels at residential properties may not exceed the standards:

- for a cumulative period of more than thirty minutes in any hour;
- plus 5 dBA for a cumulative period of more than fifteen minutes in any hour;
- plus 10 dBA for a cumulative period of more than five minutes in any hour;
- plus 15 dBA for a cumulative period of more than one minute in any hour; or
- plus 20 dBA for any period of time.

If the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.
The following adjustments are applicable to the interior standards outlined in Table 5.9-5:

- No person shall operate, or cause to be operated, any source of sound indoors at any location within the incorporated limits of the City or allow the creation of any indoor noise which causes the noise level when measured inside the receiving dwelling unit to exceed:
    - The noise standard (above) for that land use district for a cumulative period of more than five minutes in any hour;
    - The noise standard plus 5 dB for a cumulative period of more than one minute in any hour; or
    - The noise standard plus 10 dB or the maximum measured ambient, for any period of time.

If the measured indoor ambient level exceeds that permissible within any of the first two noise limit categories in this section, the allowable noise exposure standard shall be increased in five decibel (5 dB) increments in each category as appropriate to reflect the indoor ambient noise level. In the event the indoor ambient noise level exceeds the third noise limit category, the maximum allowable indoor noise level under said category shall be increased to reflect the maximum indoor ambient noise level.

Additionally, Table 5.9-6 shows adjustments to be made to the noise limits, based on background noise levels.

Table 5.9-6 Background Noise Correction

Difference between total noise and background noise alone (dB)	Amount to be subtracted from [*total measured noise level*][1] (dB)
6-8	1
9-10	0.5

Source: Long Beach Municipal Code, Chapter 8.80 (Noise).
[1] End of heading is part of the on-line code and explanatory text (italics) was added for clarity.

In addition to the residential noise standards outlined above, Section 8.80.130 (Disturbing Noises Prohibited) of the City's Municipal Code states that it is unlawful to make any loud, unnecessary, and unusual noise which disturbs the peace or quiet, or which causes discomfort or annoyance to any reasonable person, regardless of whether the noise level exceeds the standards specified above.

Section 8.80.200 (Noise Disturbances-Acts Specified) of the City's Municipal Code prohibits loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10PM and 7AM that causes a noise disturbance across a residential property line or at any time violates the standards in Table's 5.9-4 and 5.9-5.

Construction Noise

Under Section 8.80.202 (Construction Activity-Noise Regulations) of the City's Municipal Code, the City prohibits construction activities from 7PM to 7AM Mondays through Fridays (including national holidays), and before 9AM or after 6PM on Saturdays that "produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity". Construction is prohibited on Sundays, unless a permit has been issued.

Vibration

According to Section 8.80.200 (Noise Disturbances-Acts Specified) of the City's Municipal Code, it is illegal to operate any device that creates vibration above the vibration perception threshold of an individual at the property boundary of the source if on private property, or at 150 feet from the source in a public space. For the purposes of this section, "vibration perception threshold" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such directed means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold shall be presumed to be .001 g's (i.e., the acceleration of gravity) in the frequency range 0 to 30 Hz and .003 g's in the frequency range 30 to 100 Hz.

5.9.1.2 EXISTING NOISE ENVIRONMENT

The Project Site is in a developed portion of the City and is subject to noise from a myriad of transportation and stationary sources. The Project Site currently consists of residential, commercial, employment, and medical uses.

Nearby Noise Sources

On-Road Vehicles

On-road vehicles represent the most prominent source of noise in the Project Site, and the majority of traffic and resultant noise are associated with Pacific Coast Highway. Existing traffic noise conditions were modeled using the Federal Highway Administration's (FHWA) Traffic Noise Prediction computer model. Table 5.9-7 lists the calculated existing noise levels on roadways in the vicinity of the Project Site at 50 feet from the roadway centerline.

Table 5.9-7 Existing Conditions Traffic Noise Levels

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Feet (dBA CNEL)	Distance to Noise Contour (feet)		
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Long Beach Blvd	36th to 35th	30,372	71.0	59	126	272
Pacific Ave	29th to 28th	14,703	69.3	45	97	208
Atlantic Ave	29th to 28th	26,673	68.9	42	91	196
Pacific Ave	20th to 19th	16,051	66.7	30	65	140
Atlantic Ave	20th to 19th	21,646	68.0	37	79	171
Pacific Coast Hwy	Magnolia to Chestnut	35,551	74.9	105	227	489
Pacific Coast Hwy	Myrtle to Martin Luther King Jr	34,327	74.7	103	222	477
Pacific Ave	16th to 15th	12,952	65.9	26	56	121
Atlantic Ave	16th to 15th	19,672	67.6	35	74	160
Long Beach Blvd	11th to 10th	17,835	68.2	38	81	175
Atlantic Ave	North of Wardlow	24,524	68.5	40	86	186
Spring St	East of Atlantic	18,846	70.4	53	114	246
Willow St	East of Atlantic	26,273	73.5	86	185	400
Atlantic Ave	South of Willow	19,896	67.6	35	75	161

Source: FHWA Highway Traffic Noise Prediction Model based on traffic volumes provided by Fehr & Peers in February 2015. Calculations included in Appendix F.

Airports

The closest airport from the edges of the Project Site is the Long Beach Airport, approximately 1.8 miles to the northeast. Other airports in the area include the Goodyear Blimp Base, approximately 5.6 miles to the northwest and Compton Airport, approximately 6.1 miles to the northwest. Los Angeles International Airport is approximately 14.9 miles northwest of the Project Site. The Project Site is outside the 60 CNEL contour for Long Beach Airport, and well outside the 65 CNEL contour for Los Angeles International Airport. Aircrafts overflights, takeoffs, and landings are sporadically heard, but do not cause a substantial noise impact in the vicinity of the Project Site.

The Long Beach Memorial Medical Center Heliport is located within the Project Site, in northern end. Other heliports in the project vicinity include St. Mary Medical Center (0.25 miles south), World Trade Center (1.1 miles southwest), and NAA Long Beach Port (1.3 miles south). However, operation of these heliports is sporadic and would not generate substantial amounts of noise to users in the Project Site.

Light Rail

The Metro Blue Line light rail currently runs through the Project Site in a north-south direction. Residential, office, and commercial uses are located in proximity to the light rail lines in the Transit Node and Corridor Districts of the Midtown Specific Plan area. Blue Line trains run every 5 to 15 minutes on weekdays and weekends. The Blue Line rails lie between the northbound and southbound lanes of Long Beach Boulevard.

As light rail operations are intermittent[1], their influence on hourly or 24-hour noise metrics would generally be lower than noise produced by traffic on Long Beach Boulevard. However, light rail operations noise would have some affect at nearby receptors.

Stationary-Source Noise

Stationary-source noise from commercial operations within and surrounding the Project Site results primarily from mechanical sources and systems, including heaters, ventilation systems, pumps, compressors, air conditioning (HVAC), and refrigeration.

Project and Nearby Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. These uses include residences, schools, hospital facilities, houses of worship, and open space/recreation areas where quiet environments are necessary for the enjoyment, public health, and safety of the community. Commercial and industrial uses are not considered noise- or vibration-sensitive uses.

The Proposed Project would include residential, commercial, employment, and medical uses. Land uses surrounding the Project Site consists mostly of residential and commercial uses.

5.9.1.3 METHODOLOGY

Traffic Noise Modeling

The traffic noise levels for this Project were estimated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (RD-77-108). The FHWA model determines a predicted noise level through a series of adjustments to a reference sound level. These adjustments account for traffic flows, speed, truck mix, varying distances from the roadway, length of exposed roadway, and noise shielding. Vehicle speeds on each roadway were assumed to be the posted speed limit, and no reduction in speed was assigned due to congested traffic flows. Current roadway characteristics, such as the number of lanes and speed limits, were determined from field observations and according to roadway classification.

Project Land Use Compatibility

Land use compatibility is determined by the future noise level anticipated on a site and the type of existing or proposed land use on that site. In an urban environment (such as the Project area), transportation-related noise is the primary concern. Therefore, the analysis for land use compatibility addresses traffic noise impacts on proposed uses. Traffic noise contour boundaries are often utilized by local land use planning and zoning authorities to evaluate sound level exposures on land that is being considered for development and is adjacent to highways; these traffic noise contour boundaries are utilized in this analysis to assess the traffic noise level impacts to the Project. The noise contours do not take into account the effect of any existing noise barriers

[1] Trains on the Blue Line operate every six minutes during peak hours Monday through Friday. They operate every twelve minutes during the daytime weekdays and all day on the weekends after approximately 9 a.m. (with a 15-minute headway early Saturday and Sunday mornings). Night service consists of ten-minute headways (Wikipedia).

that may affect ambient noise levels, and do not take into account the noise contribution from traffic on other roadways, aircraft noise, railway noise, or noise associated with transit facilities.

Vibration

The potential for vibration impacts from freight and commuter train operations are based on FTA's general assessment procedures. The FTA includes procedures to identify areas of potential impacts with potential exposure to high levels of groundborne vibration according to the type of rail activity, distance to the tracks, and type of potentially affected use. The procedures are discussed in detail in Chapters 9 and 10 of the FTA's Transit Noise and Vibration Impact Assessment (FTA 2006). Vibration from roadway sources (such as with heavy trucks passing over potholes, pavement joints, and/or discontinuities) is generally not a notable concern from a CEQA standpoint as these conditions do not normally create vibrational energy above applicable thresholds (Caltrans, 2002).

5.9.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would result in:

N-1 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.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working the project area to excessive noise levels.

5.9.3 Environmental Impacts

The applicable thresholds are identified in brackets after the impact statement.

Impact 5.9-1:	Construction activities associated with development projects that would be accommodated by the Proposed Project would result in temporary noise increases in the vicinity of the Project Site. [Threshold N-4]

Impact Analysis: As described in detail in Chapter 3, *Project Description*, and shown in Figures 3-2, *Local Vicinity*, and 3-3, *Aerial Photograph*, the project consists of two areas along Long Beach Boulevard totaling 373 acres, stretching from Anaheim Street on the south to Wardlow Road on the north: 1) the Midtown Specific Plan area spanning approximately 369 acres from Anaheim Street on the south to Wardlow Road on the north, 2) an area outside of, but adjacent to the Midtown Specific Plan boundary, which consists of approximately 4 acres around Officer Black Park (west of Pasadena Avenue between 21st Street and 20th Street). All of these areas make up the overall Project Site and constitute the Proposed Project.

The Proposed Project would increase the number of permitted residential units within the Project Site to a little under 3,700 dwelling units—roughly 1,700 more than existing conditions. The Proposed Project also increases potential commercial and employment building square footage to approximately 3 million square feet (a net increase of approximately 369,000 square feet over existing conditions), concentrating and intensifying development at key transit, employment, and freeway nodes. The buildout projections also assume a small increase in the number of licensed hospital beds (27 beds) and the addition of a business hotel with up to 81 hotel rooms (see Table 3-3, *Overall Land Use Projections for Proposed Project*). No physical change (e.g., additional development intensity, redevelopment) is expected to occur within the area outside the Midtown Specific Plan and all existing uses within this area are expected to remain.

The potential construction-related noise impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

Midtown Specific Plan Area

Two types of temporary noise impacts could occur during construction activities associated with development that would be accommodated by the Midtown Specific Plan. First, the transport of workers and movement of materials to and from the site could incrementally increase noise levels along local access roads. The second type of temporary noise impact is related to demolition, site preparation, grading, and/or physical construction. Construction is performed in distinct steps, each of which has its own mix of equipment, and, consequently, its own noise characteristics. Table 5.9-8 lists typical construction equipment noise levels recommended for noise-impact assessments, based on a distance of 50 feet between the equipment and noise receptor.

Table 5.9-8 Construction Equipment Noise Emission Levels

Construction Equipment	Typical Max Noise Level (dBA L_{max})[1]	Construction Equipment	Typical Max Noise Level (dBA L_{max})[1]
Air Compressor	81	Pile-Driver (Impact)	101
Backhoe	80	Pile-Driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	71	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Inserter	85
Loader	85	Truck	88
Paver	89		

Source: FTA 2006.
[1] Measured 50 feet from the source

As shown Table 5.9-8, construction equipment generates high levels of noise with maximums ranging from 71 dBA to 101 dBA. Construction of individual development projects associated with the Midtown Specific Plan would temporarily increase the ambient noise environment and would have the potential to affect noise-sensitive land uses in the vicinity of an individual development project. Per Section 8.80.202 (Construction Activity-Noise Regulations) of the City's Municipal Code, construction activities are prohibited from 7:00 PM to 7:00 AM Mondays through Fridays and before 9:00 AM and after 6:00 PM on Saturdays. Construction is prohibited on Sundays, unless a permit has been issued.

Significant noise impacts may occur from operation of heavy earthmoving equipment and truck haul that would occur with construction of individual development projects. Implementation of the Midtown Specific Plan would result in an increase in development intensity throughout the Midtown Specific Plan area. Construction noise levels are dependent upon the specific locations, site plans, and construction details of individual development projects, which have not yet been developed and are not know at this time. Construction-related noise would be localized and would occur intermittently for varying periods of time.

Because specific project-level information is not available at this time, it is not possible to quantify the construction noise impacts at specific sensitive receptors. Most of the Midtown Specific Plan area is currently developed as residential, commercial, and medical uses. Construction of individual development projects associated with the Midtown Specific Plan would temporarily increase the ambient noise environment in the vicinity of each development project, potentially affecting existing and future sensitive uses in the vicinity of the development site. Because construction activities associated with any individual development project may

occur near noise-sensitive receptors and depending on the project type noise disturbances may occur for prolonged periods of time, construction noise impacts associated with implementation of the Midtown Specific Plan are considered significant.

Area Outside the Midtown Specific Plan

Under the Proposed Project, the area that is outside the Midtown Specific Plan, which covers two residential blocks around Officer Black Park (approximately 4 acres) west of Pasadena Avenue between 21st Street and 20th Street (see Figure 3-5, *Current and Proposed Zoning Designations*), would be extracted from PD 29 and retain its underlying conventional zoning designations, which include Single-Family Residential, standard lot (R-1-N); Three-Family Residential (R-3-S); and Park (P). With the exception of the zoning designation revisions that would be undertaken, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses (which include residential uses, a church, and Officer Black Park) are expected to remain. Therefore, no construction-related noise impacts are anticipated to occur.

Impact 5.9-2	Construction activities associated with development projects that would be accommodated by the Proposed Project may expose sensitive uses to strong levels of groundborne vibration. [Threshold N-2]

Impact Analysis: The potential vibration impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

Midtown Specific Plan

Roadway-Related Vibration Impacts

Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses and notes that "heavy trucks, and quite frequently buses, generate the highest earthborn vibrations of normal traffic." Caltrans further notes that the highest traffic-generated vibrations are along freeways and state routes. Their study finds that "vibrations measured on freeway shoulders (five meters from the centerline of the nearest lane) have never exceeded 0.08 inches per second, with the worst combinations of heavy trucks. This level coincides with the maximum recommended safe level for ruins and ancient monuments (and historic buildings)." Typically, trucks do not generate high levels of vibration because they travel on rubber wheels and do not have vertical movement, which generates ground vibration (Caltrans, 2002). Therefore, roadway routes within the Project Site are not expected to generate excessive vibration and traffic-induced vibration levels would be less than significant.

Railway-Related Vibration Impacts

Currently, the Metro Blue Line passes north-south through the Project Site on weekdays and weekends, with trains stopping every 5 – 15 minutes. Additionally, there are plans to expand Metro Green Line to stop within the Project Site in the future. Implementation of Proposed Project could add new sensitive uses, including residential uses, in areas adjacent to the (existing) Blue Line and (future) Green Line railways. While it is extremely rare for vibration from train operations to cause any sort of building damage (even minor cosmetic damage), there is sometimes concern about damage to fragile historic buildings location near the right-of-way

(FTA, 2006). Additionally, rail operations have the potential to produce groundborne vibration levels that can result in human annoyance or the interference with the use of vibration-sensitive equipment. Because site-specific information is not available at this time for individual development projects that would be accommodated by the Proposed Project, it is not possible to quantify future vibration levels at vibration-sensitive receptors that may be in close proximity to existing and future railways. Therefore, with the potential for sensitive uses within the Project Site to be exposed to annoying and/or interfering levels of vibration due to rail operations (per FTA criteria), such rail-related vibration impacts associated with implementation of the Proposed Project are considered significant.

Construction Vibration Impacts

Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor-building construction. 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. Vibration from construction activities rarely reaches the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site. Table 5.9-9 lists vibration levels for construction equipment.

Table 5.9-9 Vibration Levels for Construction Equipment

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS[1] Velocity at 25 Feet (in/sec)
Pile Driver (impact) Upper Range	112	1.518
Pile Driver (impact) Lower Range	104	0.644
Pile Driver (sonic) Upper Range	105	0.734
Pile Driver (sonic) Lower Range	93	0.170
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Jackhammer	79	0.035
Small Bulldozer	58	0.003
Loaded Trucks	86	0.076
FTA Criteria – Human Annoyance (Daytime/Nighttime)	78/72	—
FTA Criteria – Structural Damage	—	0.200

Source: FTA 2006
[1] RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second.

As shown in Table 5.9-9, vibration generated by construction equipment has the potential to be substantial, since it has the potential to exceed the FTA Criteria for human annoyance of 78 VdB and structural damage of 0.200 in/sec. However, groundborne vibration is almost never annoying to people who are outdoors, so it is usually evaluated in terms of indoor receivers (FTA 2006). Construction details and equipment for individual development projects that would be accommodated by the Proposed Project are not known at this time. Vibration impacts may occur from construction equipment associated with development in accordance

with the implementation of the Proposed Project. Therefore, this construction vibration impacts are considered significant.

Other Operations Vibration Impacts

Commercial and industrial operations can possibly generate varying degrees of ground vibration, depending on the operational procedures and equipment. Such equipment-generated vibrations would spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the vibration source varies depending on soil type, ground strata, and receptor-building construction. 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. Because specific project-level information is not available at this time for individual development projects that would be accommodated by the Proposed Project, it is not possible to quantify future vibration levels at vibration-sensitive receptors that may be in close proximity to existing and future vibration sources. Therefore, with the potential for sensitive uses within the Project Site to be exposed to annoying and/or interfering levels of vibration from commercial or industrial operations, such operations-related vibration impacts associated with implementation of the Proposed Project are considered significant.

Area Outside the Midtown Specific Plan

As noted above, with the exception of the zoning designation revisions that would be undertaken in this area of the Project Site under the Proposed Project, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses are expected to remain. Therefore, no vibration impacts are anticipated to occur.

Impact 5.9-3: Buildout of the Midtown Specific Plan would not cause a substantial noise increase related to traffic on local roadways in the City of Long Beach. [Thresholds N-1 and N-3]

Impact Analysis: The traffic-related noise impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

Midtown Specific Plan Area

Future development in accordance with the Midtown Specific Plan would cause increases in traffic along local roadways. Traffic noise levels were estimated using the FHWA Highway Traffic Noise Prediction Model. Traffic volumes for existing and 2035 conditions, without and with the project, were obtained from the Traffic Impact Analysis prepared by Fehr & Peers (see Appendix H). The FHWA model predicts noise levels through a series of adjustments to a reference sound level. These adjustments account for distances from the roadway, traffic flows, vehicle speeds, car/truck mix, length of exposed roadway, and road width. The distances to the 70, 65, and 60 CNEL contours for selected roadway segments in the vicinity of Midtown Specific Plan area are included in Appendix F.

A significant impact could occur if development that would be accommodated by the Midtown Specific Plan would result in an increase of 5 dBA if their resultant noise level were to remain within the objectives of the

City's General Plan (e.g., 65 dBA CNEL at a noise-sensitive location), or 3 dBA if the resultant level were to meet or exceed the objectives of the General Plan.

Table 5.9-10 presents the noise level increases on roadways over existing conditions at 50 feet from the centerline of each roadway segment. The table shows that traffic noise increases along roadways would be up to 1.0 dBA CNEL; the increases would occur due to implementation of the Midtown Specific Plan. No roadway segments would result in an increase greater than 5 dBA, or would experience substantial noise increases greater than 3 dBA resulting in noise levels greater than 65 dBA CNEL. Therefore, traffic noise increases for existing plus project conditions would be less than significant.

Table 5.9-10 Existing Conditions Traffic Noise Increases

Roadway	Segment	Existing	Existing Plus Project	Increase	Potentially Significant?
Long Beach Blvd	36th to 35th	71.0	71.0	0.0	no
Pacific Ave	29th to 28th	69.3	69.7	0.4	no
Atlantic Ave	29th to 28th	68.9	69.7	0.8	no
Pacific Ave	20th to 19th	66.7	66.5	-0.2	no
Atlantic Ave	20th to 19th	68.0	67.9	-0.1	no
Pacific Coast Hwy	Magnolia to Chestnut	74.9	74.8	-0.1	no
Pacific Coast Hwy	Myrtle to Martin Luther King Jr	74.7	75.0	0.3	no
Pacific Ave	16th to 15th	65.9	66.0	0.2	no
Atlantic Ave	16th to 15th	67.6	67.8	0.2	no
Long Beach Blvd	11th to 10th	68.2	68.2	0.0	no
Atlantic Ave	North of Wardlow	68.5	69.5	1.0	no
Spring St	East of Atlantic	70.4	70.4	0.0	no
Willow St	East of Atlantic	73.5	73.9	0.4	no
Atlantic Ave	South of Willow	67.6	67.9	0.3	no

[1] Traffic Noise Model Calculations included in Appendix F.
[2] A potentially significant would occur if the project would cause an increase greater than 3 dBA and the resulting level with the project would be greater than 65 dBA CNEL.

Table 5.9-11 presents the noise level increases on roadways over 2035 conditions at 50 feet from the centerline of each roadway segment. The table shows that traffic noise increases along roadways would be up to 0.6 dBA CNEL; the increases would occur due to implementation of the Midtown Specific Plan. No roadway segments would result in an increase greater than 5 dBA, or would experience substantial noise increases greater than 3 dBA resulting in noise levels greater than 65 dBA CNEL. Therefore, traffic noise increases for 2035 conditions would be less than significant.

Table 5.9-11 2035 Conditions Traffic Noise Increases

Roadway	Segment	2035 No Project	2035 Plus Project	Increase	Significant?
Long Beach Blvd	36th to 35th	71.2	71.6	0.4	no
Pacific Ave	29th to 28th	69.8	70.4	0.6	no
Atlantic Ave	29th to 28th	70.0	70.3	0.3	no
Pacific Ave	20th to 19th	67.1	67.2	0.1	no
Atlantic Ave	20th to 19th	68.4	68.5	0.1	no
Pacific Coast Hwy	Magnolia to Chestnut	75.4	75.5	0.1	no
Pacific Coast Hwy	Myrtle to Martin Luther King Jr	75.4	75.6	0.2	no
Pacific Ave	16th to 15th	66.7	66.7	0.0	no
Atlantic Ave	16th to 15th	68.4	68.4	0.0	no
Long Beach Blvd	11th to 10th	68.8	68.8	0.0	no
Atlantic Ave	North of Wardlow	69.9	70.1	0.2	no
Spring St	East of Atlantic	70.9	71.0	0.1	no
Willow St	East of Atlantic	74.4	74.6	0.2	no
Atlantic Ave	South of Willow	68.4	68.5	0.1	no

Notes:
1 Traffic Noise Model Calculations included in Appendix F.
2 A potentially significant would occur if the project would cause an increase greater than 3 dBA and the resulting level with the project would be greater than 65 dBA CNEL.

Area Outside the Midtown Specific Plan

As noted above, with the exception of the zoning designation revisions that would be undertaken in this area of the Project Site under the Proposed Project, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses are expected to remain. Therefore, no traffic-related noise impacts are anticipated to occur.

Impact 5.9-4: Noise-sensitive uses could be exposed to elevated noise levels from transportation sources as a result of buildout of the Proposed Project. [Thresholds N-1 and N-3]

Impact Analysis: An impact could be significant if the Proposed Project designates noise-sensitive land uses in areas that would exceed the noise compatibility criteria of the City. The state's Community Noise and Land Use Compatibility standards, summarized in Table 5.9-3, *Community Noise and Land Use Compatibility*, was used to evaluate land use compatibility. In addition, Chapter 8.80 (Noise) of the City's Municipal Code includes noise standards based on land use. Residential uses have an interior noise level standard of 45 dBA in the daytime and 35 dBA in the nighttime.[2] Hospitals have an interior noise level standard of 40 dBA any time.

The potential transportation-related noise impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

[2] The fundamental noise metric for these standards is the hourly $L_{8.3}$ level (i.e., for a period of 5 minutes within any given hour) in dBA. The allowed standards are adjusted for shorter time periods, as discussed in the text associated with Table 5.9-5, *Interior Noise Limits*.

Midtown Specific Plan Area

Future residential and medical uses within the Midtown Specific Plan area pursuant to the Midtown Specific Plan would be exposed to transportation sources. The following discusses potential noise impacts from traffic and rail activity.

Traffic Noise

As discussed above under Impact 5.9-3, traffic noise contours were calculated for 2035 conditions. Table 5.9-12 presents the noise level increases on roadways over 2035 conditions of each roadway segment in the vicinity of the Midtown Specific Plan area. The noise contours are influenced by vehicular traffic (passenger cars and trucks) speeds, and truck routes. These contours do not account for noise attenuation provided by intervening structures or topographical barriers.

Table 5.9-12 2035 With Project Conditions Traffic Noise Contours

Roadway	Segment	Daily Traffic Volumes	Noise Level (dBA CNEL)	Distance to Noise Contour (ft)		
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Long Beach Blvd	36th to 35th	34,600	71.6	64	138	297
Pacific Ave	29th to 28th	18,900	70.4	53	114	246
Atlantic Ave	29th to 28th	37,000	70.3	53	113	244
Pacific Ave	20th to 19th	17,900	67.2	32	70	150
Atlantic Ave	20th to 19th	24,300	68.5	40	86	184
Pacific Coast Hwy	Magnolia to Chestnut	41,000	75.5	116	249	538
Pacific Coast Hwy	Myrtle to Martin Luther King Jr	42,200	75.6	118	254	548
Pacific Ave	16th to 15th	16,000	66.7	30	65	140
Atlantic Ave	16th to 15th	23,900	68.4	39	85	182
Long Beach Blvd	11th to 10th	20,800	68.8	42	90	194
Atlantic Ave	North of Wardlow	35,200	70.1	51	110	236
Spring St	East of Atlantic	21,900	71.0	59	126	272
Willow St	East of Atlantic	33,200	74.6	101	217	467
Atlantic Ave	South of Willow	24,500	68.5	40	86	185

Notes: Noise levels for City roads are from 50 feet from the centerline.
Calculations are included in Appendix F.

Residential land uses located immediately adjacent to Pacific Coast Highway, Willow Street, and Long Beach Boulevard and medical uses located immediately adjacent to Long Beach Boulevard and Atlantic Avenue would be impacted by traffic noise. Residential areas immediately adjacent to Pacific Coast Highway, Willow Street, and Long Beach Boulevard could be exposed to noise levels ranging from 68.8 to 75.6 dBA CNEL (see Table 5.9-12). Residential common/open space areas such as playgrounds, swimming pools, and picnic areas are noise-sensitive areas that could be affected by elevated noise levels.

Without appropriate mitigation, sensitive outdoor uses could be developed in areas of excess of 65 dBA CNEL. As typical construction provides an exterior-to-interior noise reduction of approximately 20 to 25 dB, interior levels could be greater than 45 dBA CNEL without mitigation. Likewise, medical uses immediately adjacent to Long Beach Boulevard and Atlantic Avenue could be exposed to noise levels ranging from 68.4 to

71.6 dBA CNEL (see Table 5.9-12) and could experience interior levels that could be greater than 40 dBA. Consequently, without mitigation, impacts would be potentially significant.

Rail Noise

This analysis evaluates potential noise impacts from light rail activities to uses within the Midtown Specific Plan area. The Metro Blue Line light rail currently runs through the Midtown Specific Plan area in a north-south direction (see Figure 3-3, *Aerial Photograph*), and an extension of the Metro Green Line is planned for the future. Residential and office uses are located in proximity to the light rail lines in the Transit Node District and Corridor District. All other uses adjacent to the rail lines are commercial, and these are not considered noise-sensitive uses. As noted above, Blue Line trains currently run every 5 to 15 minutes on weekdays and weekends.

Implementation of the Midtown Specific Plan could add new sensitive uses, including residential uses, in areas adjacent to the (existing) Blue Line and (future) Green Line railways. While noise from future light rail operations may not notably change the community noise environment throughout the Midtown Specific Plan area, localized noise levels may increase for future developments in close proximity to rail lines. Because specific project-level information is not available at this time for individual development projects that would be accommodated by the Midtown Specific Plan, it is not possible to quantify future noise levels at noise-sensitive receptors that may be in close proximity to existing and future railways. Therefore, with the potential for sensitive uses within the Midtown Specific Plan area to be exposed to annoying and/or interfering levels of noise due to rail operations, such rail-related noise impacts associated with implementation of the Midtown Specific Plan are considered significant.

Area Outside the Midtown Specific Plan

As noted above, with the exception of the zoning designation revisions that would be undertaken in this area of the Project Site under the Proposed Project, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses are expected to remain. Therefore, no transportation-related noise impacts are anticipated to occur.

Impact 5.9-5: Noise-sensitive uses would not be exposed to elevated noise levels from stationary sources as a result of buildout of the Proposed Project. [Thresholds N-1 and N-3]

Impact Analysis: Noise is regulated by numerous codes and ordinances across federal, state, and local agencies. In addition, Long Beach regulates noise through the City's Municipal Code. The potential stationary-source noise impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

Midtown Specific Plan Area

Buildout of the Midtown Specific Plan would result in an increase in residential, commercial, employment, and medical development within the Midtown Specific Plan area. The primary noise sources from these land uses are landscaping, maintenance activities, mechanical equipment, and air conditioning systems. In addition, future commercial uses may include loading docks. Noise generated by residential or commercial uses is

generally short and intermittent, and these uses are not a substantial source of noise. Additionally, the City regulates noise produced by air conditioning units, landscape maintenance, and loading activities in Section 8.80.200 (Noise Disturbances-Acts Specified) of the City's Municipal Code. The City's Noise Ordinance is based on the receiving land use, protecting noise-sensitive uses regardless of neighboring uses. Noise that exceeds the limitations of the City's Municipal Code is considered a violation and is punishable by a fine or imprisonment. Consequently, stationary-source noise from these types of proposed land uses would not substantially increase the noise environment. Therefore, project-related noise impacts from stationary sources would be less than significant.

Area Outside the Midtown Specific Plan

As noted above, with the exception of the zoning designation revisions that would be undertaken in this area of the Project Site under the Proposed Project, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses are expected to remain. Therefore, no stationary-source noise impacts are anticipated to occur.

Impact 5.9-6: The proximity of the Project Site to an airport or airstrip would not result in exposure of future resident and/or workers to airport-related noise. [Thresholds N-5 and N-6]

Impact Analysis: The potential airport-related noise impacts resulting from the Proposed Project within each of the areas of the Project Site are addressed below.

Midtown Specific Plan Area

The closest airport from the edge of the Midtown Specific Plan area is the Long Beach Airport, approximately 1.8 miles to the northeast. Other airports in the area include the Goodyear Blimp Base, approximately 5.6 miles to the northwest and Compton Airport, approximately 6.1 miles to the northwest. Los Angeles International Airport is approximately 14.9 miles northwest of the Project Site. The Midtown Specific Plan area is outside the 60 CNEL contour for Long Beach Airport, and well outside the 65 CNEL contour for Los Angeles International Airport and the critical noise contours of the Goodyear Blimp Base and Compton Airport. Aircrafts overflights are sporadically heard, but do not cause a substantial noise impact in the vicinity of the Midtown Specific Plan area.

The Long Beach Memorial Medical Center Heliport is located in the northern end of Midtown Specific Plan area. Other heliports in the project vicinity include St. Mary Medical Center (0.25 miles south), World Trade Center (1.1 miles southwest), and NAA Long Beach Port (1.3 miles south). However, operation of these heliports is sporadic and would not generate substantial amounts of noise to users in the Midtown Specific Plan Area. Additionally, over congested areas, helicopters are required to maintain an altitude of at least 1,000 feet above the highest obstacle within 2,000 feet of the aircraft, except as needed for take-off and landing (Code of Federal Regulations, Title 14, Section 91.119).

Therefore, noise impacts due to aircraft operations from airports and airstrips would not be significant.

Area Outside the Midtown Specific Plan

As noted above, with the exception of the zoning designation revisions that would be undertaken in this area of the Project Site under the Proposed Project, no physical change (e.g., additional development intensity, redevelopment) is expected to occur within this area and all existing uses are expected to remain. Therefore, no aircraft-related noise impacts are anticipated to occur.

5.9.4 Cumulative Impacts

The above analysis of the Proposed Project addresses cumulative impacts with regards to operational and construction noise, as well as groundborne noise and vibration in the Project Site. Although multiple simultaneous nearby noise sources may, in combination, result in higher overall noise levels, this effect is captured and accounted for by the ambient noise level metrics that form the basis of the standards of significance for noise analysis. Any measurement of sound or ambient noise, whether for the purpose of evaluating land use compatibility, establishing compliance with noise standards, or determining point-source violations of a noise ordinance, necessarily will incorporate noise from all other nearby, perceptible sources. To specifically estimate the Proposed Project's contribution to traffic noise, existing noise levels were compared to those projected with completion of the Proposed Project. As demonstrated above, the Proposed Project's contribution to increases in ambient noise levels and vibration would be less than significant, even when accounting for traffic increases from anticipated cumulative projects.

However, construction activities may occur in close proximity to noise-sensitive receptors, resulting in significant impacts. Since details of individual development projects within the Project Site are currently unknown, it cannot be determined whether Mitigation Measure N-1 listed below would reduce the potentially significant impacts to less than significant. The Proposed Project would therefore contribute to cumulatively considerable construction-related noise and vibration, and the cumulative impact would be significant and unavoidable.

5.9.5 Existing Regulations

State

- California Code of Regulations, Title 21, Part 1, Public Utilities Code (Regulation of Airports)
- California Code of Regulations, Title 24, Part 11, California Green Building Standards Code.

City of Long Beach Municipal Code

- Chapter 8.80, Noise

5.9.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.9-3, 5.9-5, and 5.9-6.

Without mitigation, the following impacts would be **potentially significant**:

Impact 5.9-1 Noise from construction activities from implementation of development projects under the Proposed Project could result in substantial impacts to sensitive receptors.

Impact 5.9-2 Groundborne vibration from construction activities from implementation of development project under the Proposed Project could result in substantial impacts to sensitive receptors.

Impact 5.9-2 Groundborne vibration from railway operations at future development projects within the Project Site could result in significant impacts to vibration-sensitive receptors.

Impact 5.9-2 Groundborne vibration from commercial/industrial operations at future development sites within the Project Site could result in significant impacts to vibration-sensitive receptors.

Impact 5.9-4: Noise-sensitive uses could be exposed to elevated noise levels from transportation sources; both roadway and railway sources.

5.9.7 Mitigation Measures

Impact 5.9-1

N-1 Prior to issuance of demolition, grading and/or building permits for development projects accommodated by the Midtown Specific Plan, a note shall be provided on development plans indicating that ongoing during grading, demolition, and construction, the property owner/developer shall be responsible for requiring contractors to implement the following measures to limit construction-related noise:

- Construction activity is limited to the daytime hours between 7 AM to 7 PM on Monday through Friday and 9 AM to 6PM on Saturday, as prescribed in the City's Municipal Code. Construction is prohibited on Sundays.
- All internal combustion engines on construction equipment and trucks are fitted with properly maintained mufflers.
- Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.

- Stockpiling is located as far as feasible from nearby noise-sensitive receptors.
- Construction traffic shall be limited to the haul routes established by the City of Long Beach.

Impact 5.9-2

N-2 Prior to issuance of a building permit for any development project requiring pile driving or blasting during construction, the project applicant/developer shall prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts related to these activities. The maximum levels shall not exceed 0.2 inches/second, which is the level that can cause architectural damage for typical residential construction. If maximum levels would exceed these thresholds, alternative uses such static rollers, non-explosive blasting, and drilling piles as opposed to pile driving shall be used.

N-3 Prior to the issuance of building permits for development projects accommodated by the Midtown Specific Plan, if proposed vibration-sensitive land uses are located within 200 feet of any railroad line, the property owner/developer shall retain an acoustical engineer to conduct an acoustic analysis that includes a vibration analysis for potential impacts from vibration generated by operation of the rail line. Mixed-use buildings shall be designed to eliminate vibration amplifications due to resonances of floors, walls, and ceilings. The detailed acoustical analysis shall be submitted to the City of Long Beach Development Services Department prior to issuance of building permits and shall demonstrate that the vibration levels would be below 65, 72, or 75 VdB, which are the Federal Transit Administration's rail-focused groundborne vibration criteria for Category 1, 2, and 3 land uses, respectively. Category 1 uses are buildings where vibration would interfere with interior operations; Category 2 uses are residences and buildings were people normally sleep; and Category 3 uses are institutional land uses with primarily daytime use.

N-4 Prior to issuance of a building permit for projects involving the development of new industrial uses within 200 feet of any existing residential use or Development District 3 of the Midtown Specific Plan, the property owner/developer shall retain an acoustical engineer to conduct an acoustic analysis that includes a vibration analysis for potential impacts from vibration generated by industrial activities. The detailed acoustical analysis shall be submitted to the City of Long Beach Development Services Department for review and shall demonstrate that the vibration levels to any nearby residential use would be below 78 VdB during the daytime (7 AM to 10 PM) and 72 VdB during the nighttime (10 PM to 7 AM), which are the Federal Transit Administration's daytime and nighttime criteria to regulate general vibration impacts at affected residential uses.

Impact 5.9-4

N-5 Prior to issuance of a building permit for residential development projects accommodated by the Midtown Specific Plan, the project applicant/developer shall submit a final acoustical report prepared to the satisfaction of the City of Long Beach Development Services Department. The report shall demonstrate that the residential development will be sound-attenuated against present and projected noise levels, including roadway, railway, aircraft, helicopter, and stationary sources (e.g., industrial, commercial, etc.) to meet City interior standards. Specifically, the report shall demonstrate that the proposed residential design will result in compliance with the 45 dBA CNEL interior noise levels, as required by the California Building Code and California Noise Insulation Standards (Title 24 and 25 of the California Code of Regulations). The project applicant/developer shall submit the final acoustical report to the City of Long Beach Development Services Department for review and approval. Upon approval by the City, the project's acoustical design features shall be incorporated into construction of the proposed development project.

5.9.8 Level of Significance After Mitigation

Impact 5.9-1

Mitigation Measure N-1 would reduce potential noise impacts during construction to the extent feasible. However, due to the potential for proximity of construction activities to sensitive uses and potential longevity of construction activities, Impact 5.9-1 (construction noise) would remain **significant and unavoidable**.

Impact 5.9-2

Mitigation Measure N-2 would reduce potential vibration impacts during construction below the thresholds. Mitigation Measure N-3 would reduce potential train-related vibration impacts to new uses below the thresholds. Mitigation Measure N-4 (operations-related vibration) would reduce potential vibration impacts from commercial/industrial uses to less than significant levels. No significant and unavoidable vibration impacts would remain.

Impact 5.9-4

Mitigation Measure N-5 would reduce potential interior noise impacts to future noise-sensitive receptors below the thresholds. No significant and unavoidable impact would remain.

5.9.9 References

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