4.9 NOISE

This section of the EIR analyzes the potential environmental effects on noise from implementation of the proposed project. Issues scoped out from further analysis with respect to noise include proximity to or association with an airport land use plan or airstrip, as the project site is not located within an airport land use plan or affected area near an airstrip. Data used to prepare this section were taken from the Traffic Study prepared by Austin-Foust Associates (Appendix D [Traffic Study]) for the proposed project, and information obtained by measuring and modeling existing and future noise levels at the project site and in the surrounding area (Appendix C [Noise Data]). Full bibliographic entries for all reference materials are provided in Section 4.9.5 (References) at the end of this section.

4.9.1 Environmental Setting

Fundamentals of Sound and Environmental Noise

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Because the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound because of its potential to disrupt sleep, to interfere with speech communication, and to damage hearing. A typical noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Table 4.9-1 (Representative Environmental Noise Levels) lists representative noise levels for the environment.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- L_{eq}, the equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- L_{dn}, the Day-Night Average Level, is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.

Table 4.9-1 Representative Environmental Noise Levels

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

SOURCE: California Department of Transportation (1998).

- *CNEL*, the Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 to 10:00 PM and a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24 hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- L_{min}, the minimum instantaneous noise level experienced during a given period of time.
- L_{max}, the maximum instantaneous noise level experienced during a given period of time.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night, or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings that can provide noise levels as low as 20 dBA and quiet, suburban, residential streets that can provide noise levels around 40 dBA. Noise

levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with more noisy urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA).

When evaluating changes in 24-hour community noise levels, a difference of 3 dBA is a barely perceptible increase to most people. A 5 dBA increase is readily noticeable, while a difference of 10 dBA would be perceived as a doubling of loudness.

Noise levels from a particular source decline as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding, also help intensify or reduce the noise level at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., where the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., where the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Existing Environmental Noise Levels

According to the Noise Element of the City of Huntington Beach General Plan, the primary source of noise within the City is noise from motor vehicles on roadways (traffic noise). These motor vehicles include automobiles, buses, trucks, and vehicles associated with construction equipment transport. Secondary noise sources in the City include aircraft operations, railroad operations, construction activities, and petroleum extraction activities.

Existing noise measurements in the vicinity of the proposed project area were recorded for the BECSP EIR. The noise levels were measured using a Larson-Davis Model 814 precision sound level meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. The measurements are representative of the existing ambient noise levels in the proposed project vicinity, and as shown in Table 4.9-2 (Existing Ambient Noise Levels in Proposed Project Vicinity), the noise levels in the vicinity of the proposed project are dominated by roadway traffic noise and are typical of an urban environment. Figure 4.9-1 (Noise Monitoring Locations) illustrates the location of the BECSP EIR noise monitoring locations that are closest to the proposed project site.

Table 4.9-2 Existing Ambient Noise Levels in Proposed Project Vicinity

	Location	Primary Noise Sources	Noise Level Statistics		
			L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)
1	8230 Talbert Ave	Parking lot traffic	55.1	48.8	73.5
2	7841 Taylor	Light traffic on Taylor	56.9	41.7	73.2
3	8069 Ellis Ave	Traffic on Ellis/Traffic on Beach	66.7	49.8	82.4
4	7771 Ellis Ave	Traffic on Ellis, barking dog	61.0	43.8	75.4
5	18900 Delaware St	Traffic on Delaware, mobile blood lab generator	61.9	47.6	75.8
6	8072 Constantine Dr	Traffic on Beach, minor road work	63.1	47.0	85.4

SOURCE: Atkins, formerly PBS&J (2008).

Similarly, existing roadway noise levels were calculated for roadway segments in the BECSP EIR that are proximate to existing or future noise-sensitive uses and would receive a moderate to large share of the project trips. This task was accomplished using the Federal Highway Administration (FHWA) Highway Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the project traffic analysis. The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) utilized in the FHWA Model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data show that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. As average daily traffic (ADT) along these roadways has not substantially changed since the BECSP EIR, the noise levels for roadways in the vicinity of the proposed project are presented in Table 4.9-3 (Existing Roadway Noise Levels Off Site).

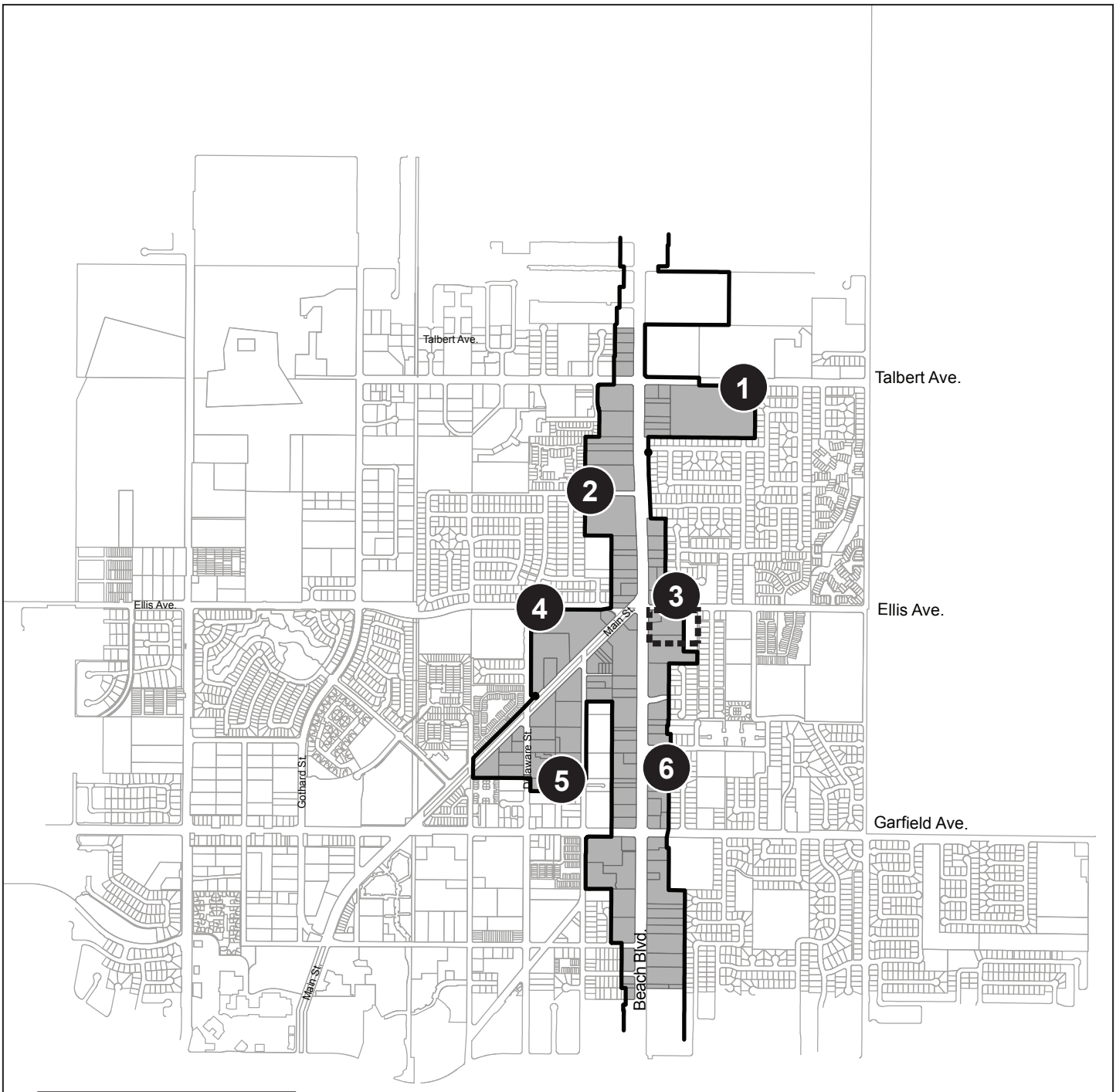
Table 4.9-3 Existing Roadway Noise Levels Off Site

Roadway	Roadway Segment	dBA L_{dn}
Beach Boulevard	Slater Ave and Talbert Ave	71.1
	Talbert Ave and Ellis Ave	70.5
	Ellis Ave and Garfield Ave	70.6
	Garfield Ave and Yorktown Ave	70.7
Ellis Avenue	Beach Blvd and Newland St	65.1
	Newland St and Magnolia St	64.6

SOURCE: Atkins, formerly PBS&J (2009) (calculation data and results are provided in Appendix C)

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).



***Source*:** City of Huntington Beach; Atkins, 2010.

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Figure 4.9-1
Noise Monitoring Locations

ATKINS

The background vibration velocity level in residential and educational 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. As such, 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 4.9-4 (Human Response to Different Levels of Groundborne Vibration).

Table 4.9-4 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: HMMH (2006).

Existing Groundborne Vibration Levels

Aside from seismic events, the greatest source of groundborne vibration in the project area is roadway truck and bus traffic. 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.

4.9.2 Regulatory Framework

Refer to Section 4.9.2 (Regulatory Framework) of the BECSP Program EIR, for applicable federal, state, and local regulations that would apply to the proposed project. No new regulations have been implemented since the certification of the Program EIR.

The BECSP Development Code, which includes development standards, development regulations, and guidelines, governs all development actions with the BECSP area, including the proposed project site. The proposed project would be subject to development standards specific to the proposed project site's BECSP designations of Town Center Neighborhood, included as BECSP Section 2.1.4 (Town Center Neighborhood).

General Plan and BECSP Consistency Analysis

The proposed project would be consistent with the identified goals and policies of the City of Huntington Beach's General Plan regarding noise and vibration. The proposed project will be

constructed during the hours allowed by the City's Municipal Code. Design of the proposed project is such that noise generated by the retail uses would be located at ground level and separate from the majority of the residential uses which would reduce commercial and retail generated noise levels from spilling into the residential portion of the site, as is common for mixed-use developments. Additionally, the residential uses would be constructed such that interior noise levels would not exceed the standards set forth by the City. Noise from mechanical equipment associated with operation of the project would be required to comply with the state Building Code requirements pertaining to noise attenuation, and with City regulations requiring adequate buffering of such equipment. Compliance with the City of Huntington Beach Noise Ordinance and design features would ensure that the construction and operation of the proposed project would be consistent with the indentified goals and policies of the City's General Plan Noise Element.

As shown under Impact 4.9-5, future roadway noise would not increase substantially over that evaluated in the BECSP EIR. The proposed project would not generate increased local roadway noise levels in the near or long term. Therefore, the proposed project would not conflict with the applicable policies.

4.9.3 Project Impacts and Mitigation

Analytic Method

This analysis is based on noise-level monitoring, noise-prediction modeling, and empirical observations. As defined in the City's General Plan Noise Element, noise-sensitive land uses include public schools, hospitals, and institutional uses, including churches, museums, and private schools. Typically, residential uses are also considered noise-sensitive receptors. Therefore, for the purposes of this analysis, the nearest existing sensitive receptors to the project site would be the existing quasi-residential and residential uses immediately adjacent to the project site and to the east along Ellis Avenue, and the multi-family properties along Ellis Avenue to the north of the proposed project site.[46] The quasi-residential uses adjacent to the project site share a property line; however the units are approximately 75 feet to the east of the project site. The multi-family uses are located approximately 75 feet from the project site.

Existing noise levels were monitored at selected locations within the BECSP area surrounding the project site using a Larson-Davis Model 814 precision sound-level meter, which is consistent with the standards of the ANSI for general environmental noise measurement instrumentation. As the noise environment within the project site vicinity has not substantially changed since the analysis prepared for the BECSP EIR, the measurements taken for the BECSP area are appropriate for this analysis. Noise modeling procedures involved the calculation of existing and future vehicular noise levels along individual roadway segments in the project area. This task was accomplished using the FHWA Highway Noise Prediction Model (FHWA RD 77 108). Traffic volumes utilized as data inputs in the noise prediction model were provided by the Traffic Impact Analysis prepared by Austin-Foust Associates for the proposed project. The analysis considers future cumulative traffic noise levels, in recognition of expected higher traffic

[46] The primary use immediately adjacent to the project site to the east is a single-room occupancy (SRO) project, which is classified by the City as a quasi-residential use and is only allowed on property zoned Commercial General or Industrial.

volumes and resultant noise levels in the future, which provide an appropriate benchmark against which future noise resulting from implementation of the Specific Plan can be assessed.

Thresholds of Significance

The following thresholds of significance are based on Appendix G of the 2011 CEQA Guidelines, the Huntington Beach General Plan, and the Huntington Beach Municipal Code. For purposes of this EIR, implementation of the proposed project may have a significant adverse impact on noise if it would:

- Expose 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
- Expose persons to or generation of to excessive groundborne vibration levels or noise levels
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- Be 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 and expose people residing or working in the project area to excessive noise levels
- Be located within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels

Human Exposure to Noise

The CEQA Guidelines do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. Based on the noise measurements shown in Table 4.9-2, the ambient noise in the vicinity of the project area currently ranges from 58.0 to 72.8 dBA L_{eq}. Therefore, for the purposes of this EIR, an increase of 3 dBA in ambient noise levels would be considered a significant impact.

Additionally, noise generated by construction activities is regulated by the City of Huntington Beach Municipal Code. Construction activities that would occur outside the designated hours established by Section 8.40.090(d) would be potentially significant. Similarly, operational noise resulting from heating ventilation and cooling systems (HVAC), deliveries, and refuse collection are also regulated by the City's Municipal Code, and noise generated by these activities that exceeds the City's established standards would be potentially significant.

The CEQA Guidelines also do not define the levels at which groundborne vibration or groundborne noise is considered "excessive." For the purpose of this analysis, groundborne vibration impacts associated with human annoyance would be significant if vibration caused by implementation of the proposed project exceeds 85 VdB, which is the vibration level that is considered by the Federal Transit Administration (FTA) to be acceptable only if there are an infrequent number of events per day (as described in Table 4.9-4). In terms of groundborne vibration impacts on structures, this analysis will use

the FTA's vibration damage threshold of approximately 100 VdB for fragile buildings and approximately 95 VdB for extremely fragile historic buildings.[47]

Effects Not Found to Be Significant

Threshold	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project site is not located within 2 miles of a public airport, public use airport, or private airstrip. There are no private airstrips in the nearby vicinity; however there is an existing helipad 1.47 miles north of the proposed project site on the rooftop of the fifteen-story office tower at the southwest corner of Beach Boulevard and Warner Avenue. A helipad is a designated area, including buildings or facilities, intended to be used for the landing and takeoff of helicopters. However, the existence of such a facility does not necessarily represent an impending impact for residents. Further, the existing helipad has not been used in over three years and the proposed project for that site would not alter the helipad use.[48] Therefore, the project would not expose people to excessive noise from airports. No impact would occur, and no further analysis of this issue is required in the EIR.

Impacts and Mitigation Measures

Threshold	Would the proposed project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impact 4.9-1 **Implementation of the proposed project could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. This would be a potentially significant impact. Implementation of mitigation measures would reduce this impact to a *less than significant* level.**

Construction

The proposed project would result in a six-story mixed-use development consisting of retail and residential uses. The proposed project would result in the construction of approximately 37,000 sf of retail uses, 105 residential units, and a 483-space parking structures (220 retail and 263 residential parking spaces). Figure 3-3 (Proposed Project Site Plan) illustrates how the proposed and existing buildings would be oriented on the project site and their relationship to Beach Boulevard and Ellis Avenue. Construction activities would occur in one phase with four discrete construction related activities;

[47] Harris Miller Miller & Hanson Inc., *Transit Noise and Vibration Impact Assessment, Final Report* (May 2006).
[48] Rosemary Medel, written communication via email with City of Huntington Beach (April 22, 2009).

demolition, grading and excavation, building construction and architectural coating. Demolition of the approximately 27,784 sf of existing building area on the project site would take approximately 2 months, beginning in January 2016. Excavation would take approximately 3 months to complete. Sub-grade construction would take approximately 3 months. Building construction would take approximately 15 months. Upon completion of the building construction, architectural coating would be applied, with construction activities anticipated to be completed by summer 2017. As such, construction of the proposed building would be complete in approximately 23 months, just under two years. Levels one and two of the proposed project would house the commercial component, including an approximately 30,000 sf market use, approximately 7,000 sf of retail shops, and retail parking. Additionally, approximately 1,850 sf of public open space will be provided for the retail uses at street level, located at the corner of Beach Boulevard and Ellis Avenue. Parking for the residential portion of the proposed project would be provided on level three. Levels four through six would include 105 residential units and 10,500 sf of open space for residential use.

Demolition, grading and building construction involve the use of heavy equipment. Construction activities would also involve the use of smaller power tools, generators, and other equipment that are sources of noise. Haul trucks using the local roadways would generate noise as they move along the road. Each stage of construction would involve a different mix of operating equipment, and noise levels would vary based on the amount and types of equipment in operation and the location of the activity.

The USEPA has compiled data regarding the noise generating characteristics of typical construction activities. These data are presented in Table 4.9-5 (Noise Ranges of Typical Construction Equipment) and Table 4.9-6 (Typical Outdoor Construction Noise Levels). These noise levels would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA (to 74 dBA) at 200 feet from the source to the receptor.

The closest noise sensitive receptors to the project site would be the quasi-residential use located adjacent and east of the project site along Ellis Avenue and the multi-family residential uses located to the north of the project site across from Ellis Avenue and Patterson Lane. While the uses to the east share a property line with the project site, the buildings are located approximately 75 feet from the project site. Based on the information presented in Table 4.9-6, construction activity noise levels at these uses would be approximately 83 dBA during the excavation/grading and external finishing phases of the proposed project.

Most of the types of exterior construction activities associated with the proposed project would not generate continuously high noise levels, although occasional single-event disturbances from grading and external building construction are possible.

Under Section 8.40.090(d) (Special Provisions) of Chapter 8.40 of the City's Municipal Code, noise sources associated with construction are exempt from the requirements of the Municipal Code, provided that the Applicant has acquired the proper permit(s) from the City and construction activities do not occur between the hours of 8:00 PM and 7:00 AM on weekdays, including Saturday, or at any time on Sunday or a federal holiday. As construction would not occur except during the times permitted in the

Noise Ordinance, and as Section 8.40.090(d) of the Municipal Code allows construction noise in excess of standards to occur between these hours, the proposed project would not violate established standards.

Table 4.9-5 Noise Ranges of Typical Construction Equipment

Construction Equipment	*Noise Levels in dBA L_{eq} at 50 feet*[1]
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
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

SOURCE: USEPA (1971).

Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.

Table 4.9-6 Typical Outdoor Construction Noise Levels

Construction Phase	*Noise Level at 50 Feet with Mufflers (dBA L_{eq})*	*Noise Level at 75 Feet with Mufflers (dBA L_{eq})*	*Noise Level at 200 Feet with Mufflers (dBA L_{eq})*
Ground Clearing	82	79	70
Excavation/Grading	86	83	74
Foundations	77	74	65
Structural	83	80	71
External Finishing	86	83	74

SOURCE: USEPA (1971).

The noise levels at the off-site sensitive uses were determined with the following equation from the HMMH *Transit Noise and Vibration Impact Assessment, Final Report*: **$L_{eq} = L_{eq}$ at 50 ft. – 20 Log(D/50)**, where L_{eq} = noise level of noise source, D = distance from the noise source to the receiver, $L_{eq\ at\ 50\ ft.}$= noise level of source at 50 feet.

To reduce the noise levels resulting from construction of the proposed project to the extent feasible, the mitigation measures BECSP MM4.9-1 through BECSP MM4.9-3 shall be implemented:

BECSP MM4.9-1 *Project applicants shall require by contract specifications that the following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels:*

- *Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses within 300 feet of a project site disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period*
- *Ensure that construction equipment is properly muffled according to industry standards and be in good working condition*
- *Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible*
- *Schedule high-noise-producing activities between the hours of 8:00 AM and 5:00 PM to minimize disruption on sensitive uses, Monday through Saturday; schedule pile-driving activities between the hours of 8:00 AM and 4:00 PM on Mondays through Fridays only*
- *Implement noise attenuation measures, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources*
- *Use electric air compressors and similar power tools rather than diesel equipment, where feasible*
- *Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 10 minutes*
- *Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent; if the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective action, and report the action taken to the reporting party*

Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

BECSP MM4.9-2 *Project applicants shall require by contract specifications that construction staging areas along with the operation of earthmoving equipment within the project area would be located as far away from vibration and noise sensitive sites as possible. Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.*

BECSP MM4.9-3 *Project applicants shall require by contract specifications that heavily loaded trucks used during construction would be routed away from residential streets. Contract specifications shall be included in the proposed project construction documents, which shall be reviewed by the City prior to issuance of a grading permit.*

Implementation of mitigation measures BECSP MM4.9-1 through BECSP MM4.9-3 and adherence to Municipal Code Section 8.40.090(d) would ensure that impacts associated with construction-related noise would be minimized. Therefore, this impact would be ***less than significant***.

Operation

Sources of noise generated by implementation of the proposed project would include new stationary sources (such as rooftop HVAC systems for the residential and commercial uses). Large-scale HVAC systems would be installed for the new residential and commercial uses within the proposed project that could result in noise levels that average between 50 and 65 dBA L_{eq} at 50 feet from the equipment. It is assumed that HVAC units would be mounted on the rooftops of the proposed building. In addition, the installation of shielding around these HVAC systems would be required as part of the proposed project, as stated in mitigation measure BECSP MM4.9-4.

BECSP MM4.9-4 *Project applicants shall provide proper shielding for all new HVAC systems used by the proposed residential and mixed-use buildings to achieve a noise attenuation of 15 dBA at 50 feet from the equipment.*

The shielding installed around these systems would typically reduce noise levels by approximately 15 dBA, which could reduce HVAC system noise to approximately 50 dBA L_{eq} at 50 feet from the equipment. Implementation of mitigation measure BECSP MM4.9-4 would ensure that impacts to on- and off-site noise sensitive receptors related to the HVAC systems would remain below the exterior noise standard established in the City's Noise Element and Municipal Code and would be considered ***less than significant***.

Operation of the proposed project would involve the delivery of goods and food stuffs to the commercial and retail operations associated with the proposed project, as well as refuse pick up for both the commercial and residential components. Two noise sources would be identified with delivery operations: the noise of the diesel engines of the semi-trailer trucks and the backup beeper alarm that sounds when a truck is put in reverse, as is required and regulated by California Occupational Safety and Health Administration (Cal/OSHA). The noise generated by idling diesel engines typically ranges between 64 and 66 dBA L_{eq} at 75 feet. This noise would be temporary in nature, typically lasting no more than 5 minutes. Backup beepers are required by Cal/OSHA to be at least 5 dBA above ambient noise levels. These devices are highly directional in nature, and when in reverse the trucks and the beeper alarm would be directed towards the loading area and adjacent commercial structures. Backup beepers are, of course, intended to warn persons who are behind the vehicle when it is backing up.

Implementation of the proposed project would result in the construction of a mixed-use residential and retail project that would replace the existing retail, restaurant, and gas station uses on the project site. As such, the introduction of residential uses on the project site would create an extension of the established neighborhood located to the east and northeast of the project site. The proposed project would result in an intensification of human activity at the proposed project site with the introduction of a permanent, residential population. This could increase noise levels at the identified off-site residential receptors. Quasi-residential and residential uses are located adjacent and to the east of the site along Ellis Avenue and to the north along Ellis Avenue and Patterson Lane, at a distance of approximately 75 feet from the project site. However, once operational, noise levels from residential and retail activities on the project site are not anticipated to be greater than the established 55 dBA limit for areas with a residential zone. Furthermore, the retail and commercial uses proposed at the project site would be a continuation of existing retail and commercial uses at the project site and noise levels generated would not change

substantially. The proposed residential uses are oriented such that courtyards and patios would be internal to the project site, which would shield the residential uses from off-site noise sources. As such, the introduction of new residential uses and an intensification of commercial and retail activities would result in a ***less than significant*** impact.

As shown in Table 4.9-2 (Existing Ambient Noise Levels in Proposed Project Vicinity), noise monitoring in the vicinity of the project site indicates that existing noise levels in the area currently exceed the City noise standards for residential uses, especially along Ellis Avenue. The City of Huntington Beach General Plan states that sensitive uses (such as residences) should incorporate sound-reducing measures, including fences, walls, etc., when constructed in areas exposed to greater than existing standards. As such, mitigation measure BECSP MM4.9-5 shall be implemented for the residential development associated with the proposed project, as the existing noise levels exceed the City standards as set forth in Section 8.40.070 and Section 8.40.080 of the Municipal Code.

BECSP MM4.9-5 *Prior to issuance of building permits, project applicants shall submit an acoustical study for each development, prepared by a certified acoustical engineer. Should the results of the acoustical study indicate that that exterior (e.g., patios and balconies) and interior noise levels would exceed the standards set forth in the City of Huntington Beach Municipal Code Sections 8.40.050 through 8.40.070, the project applicant shall include design measures that may include acoustical paneling or walls to ensure that noise levels do not exceed City standards. Final project design shall incorporate special design measures in the construction of the residential units, if necessary.*

In addition, implementation of mitigation measure BECSP MM4.9-5 would ensure that exterior living spaces, such as porches and patios are constructed in a manner that noise levels, including noise from retail delivery activities do not exceed the City noise standards. With implementation of mitigation measure BECSP MM4.9-4, development within the project area would be required to shield HVAC systems such that noise attributed to such systems would not increase noise levels above City standards. Therefore, this impact would be reduced to a level of ***less than significant***.

Threshold	Would the proposed project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Impact 4.9-2 **Implementation of the proposed project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. This would be a *less than significant* impact.**

Construction

This analysis uses the FTA vibration impact thresholds for sensitive buildings, residences, and institutional land uses. These thresholds are 85 VdB, which is the vibration level that is considered by the FTA to be acceptable only if there are an infrequent number of events per day (as described in Table 4.9-4 [Human Response to Different Levels of Groundborne Vibration]). In terms of groundborne vibration impacts on nearby structures, this analysis will use the FTA's vibration damage threshold of approximately 100 VdB for fragile buildings.[49]

[49] Harris Miller Miller & Hanson Inc., *Transit Noise and Vibration Impact Assessment, Final Report* (May 2006).

Certain construction activities that would occur under the proposed project would have the potential to generate groundborne vibration. Table 4.9-7 (Vibration Source Levels for Construction Equipment) identifies various vibration velocity levels for the types of construction equipment that would operate at the project site during construction.

Table 4.9-7 Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB	
	50 Feet	75 Feet[a]
Large Bulldozer	81	78
Caisson Drilling	81	78
Loaded Trucks	80	77
Jackhammer	73	70
Small Bulldozer	52	49

SOURCE: Federal Railroad Administration (1998); Atkins, formerly PBS&J (2008).

a The vibration levels at the off-site sensitive uses are determined with the following equation from the HMMH Transit Noise and Vibration Impact Assessment, Final Report: Lv(D)=Lv(25 ft) – 20log(D/25), where Lv = vibration level of equipment, D = distance from the equipment to the receiver, Lv(25 ft) = vibration level of equipment at 25 feet.

Construction activities would have the potential to impact the surrounding sensitive receptors adjacent and to the east of the project site. Based on the information presented in Table 4.9-7, vibration levels could reach approximately 78 VdB for the existing off-site residential receptors. As such, the quasi-residential and residential uses to the east and north of the project site, and other sensitive receptors would not experience vibration levels during construction of the proposed project that would exceed the FTA's vibration impact threshold of 85 VdB for human annoyance. Implementation of mitigation measures BECSP MM4.9-1 through BECSP MM4.9-3 would help to reduce this impact, and therefore, this impact would be considered ***less than significant***.

Operation

During operation of the proposed project, background operational vibration levels would be expected to average around 50 VdB. This is substantially less than the 85 VdB threshold for people in the vicinity of the project site. Groundborne vibration resulting from operation of the proposed project would primarily be generated by trucks making periodic deliveries to the commercial and retail uses associated with the proposed project. No substantial sources of groundborne vibration would be built as part of the proposed project; therefore, operation of the proposed project would not expose sensitive receptors on-site or off-site to excessive groundborne vibration or groundborne noise levels, and this impact would be ***less than significant***.

Threshold	Would the proposed project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Impact 4.9-3 **Implementation of the proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. This would be a *less than significant* impact.**

For the purposes of this noise analysis, the year 2030 traffic volumes without the proposed project assumes full build-out of the land uses allowed under the BECSP. These resulting noise levels were then compared to the noise levels that would occur from implementation of the proposed project. As shown in Table 4.9-8 (Current and Future [2030] Roadway Noise Levels in Project Vicinity), the vehicle trips associated with the proposed project would result in an increase of noise levels by 0.4 dBA L_{dn} along Ellis Avenue between Beach Boulevard and Newland Street; an increase of 0.1 dBA L_{dn} along Beach Boulevard between Slater Avenue and Talbert Avenue and between Talbert Avenue and Ellis Avenue; and along Ellis Avenue between Newland Street and Magnolia Street. These minor increases in noise levels are a result of shifting traffic patterns on the arterial streets in the project vicinity due to the proposed project. As shown in Table 4.9-8, noise levels along Beach Boulevard between Ellis Avenue and Yorktown Avenue would not increase as a result of the proposed project. For the purpose of this analysis, a permanent increase of 3 dBA L_{dn} over ambient noise levels without the project is considered to be substantial. The greatest increase in future roadway noise levels is anticipated to be 0.4 dBA L_{dn} along Ellis Avenue between Beach Boulevard and Newland Street. This increase would be inaudible/imperceptible to most people and would not exceed the identified threshold of significance. Therefore, this impact would be considered ***less than significant***.

Table 4.9-8 Current and Future (2030) Roadway Noise Levels

		Noise Levels in dBA L_{dn}						
	Roadway Segment	*Existing*	*Year 2030 Without Project Traffic*	*Year 2030 Increase Without Project*	*Year 2030 With Project Traffic*	*BECSP Related Increase*	*Significance Threshold*[1]	*Exceeds Significance Threshold?*
Beach Boulevard	Talbert Ave and Ellis Ave	70.5	71.0	0.5	71.3	0.3	3.0	No
	Ellis Ave and Garfield Ave	70.6	71.4	0.8	71.4	0.0	3.0	No
	Garfield Ave and Yorktown Ave	70.7	70.8	0.1	70.8	0.0	3.0	No
Ellis Avenue	Beach Blvd and Newland St	65.1	65.7	0.6	66.1	0.4	3.0	No
	Beach Boulevard and Gothard St.	61.3	61.3	0.0	61.2	-0.1	3.0	No

SOURCE: Atkins, formerly PBS&J (2010) (calculation data and results are provided in Appendix C).

Impact 4.9-4 **Increased human activity associated with the operation of the proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. This would be a *less than significant* impact.**

As described in Chapter 3 (Project Description), the proposed project would serve as a mixed-use residential and retail center. Operation of the proposed project would involve the use of HVAC systems; however, noise levels from HVAC systems are regulated by the City of Huntington Beach, and implementation of mitigation measure BECSP MM4.9-4 would ensure that the use of HVAC systems would not result in a substantial increase in ambient noise levels. According to data referenced by the EPA, normal human conversation produces noise levels of 65 dBA at a distance of approximately 3 feet. The closest noise sensitive receptors to the project site would be quasi-residential uses located adjacent and the east of the project site along Ellis Avenue and the residential uses located to the north of the project site across from Ellis Avenue and Patterson Lane. These uses are approximately 75 feet from the project site. Noise associated with typical retail activities would attenuate at a rate of 6 dBA per doubling of distance to levels below 50 dBA at 75 feet away, which would be below the City of Huntington Beach Noise Ordinance Exterior Noise Standards. Additionally, the proposed project would be required to comply with Policy N 1.5.1 of the City's General Plan Noise Element, which requires that commercial and residential mixed-use structures minimize noise transmission through the use of materials that would mitigate sound transmission, or through the configuration of interior spaces to minimize sound amplification. Therefore, noise levels resulting from an increase in human activity at the proposed project site would not substantially increase the ambient noise levels to noise sensitive receptors on- or off-site and this impact would be considered ***less than significant***.

Parking structures can be a source of annoyance due to automobile engine start-ups and acceleration, and the activation of car alarms. Parking structures can generate L_{eq} noise levels between 49 dBA L_{eq} (tire squeals) and 74 dBA L_{eq} (car alarms) at 50 feet. Due to the high level of traffic noise along streets surrounding the project site, normal daytime parking structure L_{eq} noise would not likely be audible due to the masking of noise by traffic on nearby roadways. The new parking structure would be developed within the interior of the mixed-use building, which would serve to screen occasional parking structure noise from off-site uses from increased noise exposure. Therefore, noise impacts relating to on-site parking would be considered ***less than significant,*** and no substantial increase in ambient noise levels would occur.

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

Impact 4.9-5 **Implementation of the proposed project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. This would be a *less than significant* impact.**

Construction

Construction activities would represent a substantial temporary or periodic increase in ambient noise levels. As discussed previously under "Thresholds of Significance," this analysis assumes that an increase of 3.0 dBA or greater over ambient noise levels is substantial and significant. As shown in Table 4.9-2, the highest existing daytime ambient noise level monitored in the project vicinity was 66.7 dBA L_{eq} at 8069 Ellis Avenue. Construction activities could reach 83 dBA at 50 feet. As such, the noise generated by construction activities for the proposed project could result in a temporary increase in ambient noise levels of over 3 dBA at uses adjacent to the project site. However, the construction activities would only occur during the permitted hours designated in the City of Huntington Beach Municipal Code, and thus would not occur during recognized sleep hours for residences or on days that residents are most sensitive to exterior noise (Sundays and holidays). As such, while an increase in ambient noise levels could occur from the construction activities associated with the proposed project, an adverse effect on the nearby residents would not occur because construction noise is not restricted pursuant to the Municipal Code as long as it occurs during permitted hours. Implementation of mitigation measures BECSP MM4.9-1 through BECSP MM4.9-3 would further reduce this impact to ***less than significant***.

Operation

Operation of the proposed project would not include special events or temporary activities that would cause an increase in ambient noise levels. In addition, operation of the proposed project would not require periodic use of special stationary equipment that would expose off-site sensitive receptors to an increase in ambient noise levels above those existing without the proposed project. Impact 4.9-1 and Impact 4.9-4 evaluate the potential for mechanical equipment, which would be assumed to be a constant/permanent source of ambient noise levels, attributable to the proposed project to increase ambient noise levels. Therefore, there would be no temporary or periodic noise increases to on- or off-site receptors due to operation of the proposed project. This impact would be ***less than significant***.

4.9.4 Cumulative Impacts

A cumulative impact analysis is only provided for those thresholds that result in a less than significant impact or significant and unavoidable impact, and is not provided for those thresholds that result in no project-related impacts.

The geographic context for the analysis of cumulative noise impacts depends on the impact being analyzed. For construction impacts, only the immediate area around the proposed project site would be included in the cumulative context. For operational/roadway related impacts, the context is build-out of the City of Huntington Beach General Plan, including existing and future development of cumulative projects within the City of Huntington Beach, as well as adjacent communities that would be potentially impacted. This cumulative impact analysis considers development of the proposed project, in conjunction with ambient growth as discussed in Section 4.13 (Transportation/Traffic), and other development within the vicinity of the proposed project in the City of Huntington Beach and surrounding jurisdictions. Noise is by definition a localized phenomenon, and significantly reduces in magnitude as distance from the source increases. Consequently, only projects and growth due to occur in the Huntington Beach area would be likely to contribute to cumulative noise impacts.

Threshold	Would the proposed project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Increases in noise at sensitive uses would occur as a result of construction of the proposed project, along with other construction in the vicinity. As discussed under Impact 4.9-1, construction of the proposed project would expose nearby sensitive receptors to exterior noise levels above the 55 dBA noise standard identified in the Huntington Beach Municipal Code. This construction noise would be temporary, and mitigation measures are being implemented to reduce the impact of the noise; however, exterior noise levels would still be above 55 dBA.

Other construction that may occur in the vicinity of the proposed project site would contribute noise levels similar to those generated for the proposed project. Where this development adjoins the proposed project construction, the combined construction noise levels would have a cumulative effect on nearby sensitive uses. Noise is not strictly additive, and a doubling of noise sources would not cause a doubling of noise levels; however, cumulative construction noise levels would be in excess of the City's Municipal Code exterior standard at nearby sensitive receptors.

Under Section 8.40.090(d) (Special Provisions) of Chapter 8.40 of the City's Municipal Code, noise sources associated with construction are exempt from the requirements of the Municipal Code, provided that construction activities do not occur between the hours of 8:00 PM and 7:00 AM on weekdays, including Saturday, or at any time on Sunday or a federal holiday. Because compliance with this construction time limit is required by the Huntington Beach Municipal Code, the proposed project and all other cumulative development would be exempt, and the cumulative impact associated with construction noise in the Huntington Beach area would be considered less than significant. Similarly, because construction-related noise generated under the proposed project would be exempt from established noise standards, the cumulative impact of the project would also be ***less than significant***.

With regards to stationary sources, noise would be generated by sources at the proposed project and other projects in the vicinity, including the operation of existing commercial uses located along Beach Boulevard. The major stationary source of noise that will be introduced into the Huntington Beach area would likely be HVAC equipment located on the rooftops of new developments and residential uses. As discussed, this HVAC equipment generally produces noise levels of around 50 and 65 dBA L_{eq} at 50 feet from the equipment. Shielding, which is required by mitigation for the proposed project, could reduce these noise levels by up to 15 dBA, to about 35 to 50 dBA L_{eq} at 50 feet, depending on whether the equipment serves residential or commercial uses. Because shielding would be required for all development associated with the proposed project, noise levels from individual stationary sources would not exceed the applicable City noise standard, and because this shielding would be expected to be installed on all new development in the Huntington Beach area, it is expected that all rooftop stationary sources in the proposed project area would similarly generate ***less than significant*** noise levels.

Threshold	Would the proposed project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction of the proposed project would produce temporary vibration impacts that would be less than significant. Cumulative development in the Huntington Beach area are not considered likely to result in the exposure of on-site or off-site receptors to excessive groundborne vibration, due to the localized nature of vibration impacts, the fact that all construction would not occur at the same time and at the same location, and the largely built-out nature of the City, which would usually preclude the use of heavy equipment such as bulldozers. No other projects are proposed in close enough proximity to affect the same receptors as the proposed project. Only receptors located in close proximity to each construction site would be potentially affected by both activities. For the combined vibration impact from any two projects to reach cumulatively significant levels, heavy construction activity from both projects would have to occur simultaneously within 50 feet of any receptor. It is unlikely that construction activities from the proposed project and cumulative projects would be located within 50 feet of the same receptor. Therefore, vibration from future development would not combine with construction vibration of the proposed project to result in a significant cumulative impact. The contribution of the proposed project to such an impact would not be cumulatively considerable because the proposed project would include mitigation to reduce the project's impact, and the cumulative impact of the project would be ***less than significant***.

Threshold	Would the proposed project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

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 project site. 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 cumulative base traffic volumes without the project, and cumulative base traffic volumes with the project are identified in Table 4.9-8. Noise level increases in the project area would reach a maximum of 0.4 dBA L_{dn} along Ellis Avenue between Beach Boulevard and Newland Street, which is inaudible/imperceptible to most people. The contribution of the proposed project would range from 0 to 0.4 dBA across all project area intersections studied. No study roadway segments would increase by 3.0 dBA L_{dn} or more established threshold. The 0 to 0.4 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.

Increased human activity due to the mix of residential and commercial components of the proposed project would result in an increase in noise levels. The main contribution to noise levels that would potentially result in cumulative effects would be stationary equipment and the parking structure associated with the proposed project, and the related mixed-use projects within the vicinity. Parking structures can generate L_{eq} noise levels of between 49 dBA L_{eq} (tire squeals) and 74 dBA L_{eq} (car alarms) at 50 feet. Due to the high level of traffic noise along streets surrounding the project site, normal daytime parking structure L_{eq} noise would not likely be audible due to the masking of noise by traffic on nearby

roadways. Due to distance from sensitive receptors, it is unlikely that noise from multiple related projects would interact to create a significant combined noise impact from parking structures.

As discussed above, noise is not strictly additive; a doubling of noise sources does not create a doubling of noise levels. Because all rooftop equipment would be shielded, no source would generate maximum noise levels of greater than 57 dBA L_{eq} at 50 feet. Consequently, multiple units would have to be located within 50 feet of a receptor to achieve noise levels that would exceed the City standards. The development associated with the proposed project and other nearby projects are not so dense that multiple stationary units would be so closely spaced, either on site or off site. Consequently, the cumulative effect of multiple HVAC units, mechanical equipment, and parking structures would be ***less than significant***.

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

Periodic and temporary noise levels would be generated by construction of the proposed project along with other construction in the vicinity, and sensitive uses on or in the immediate vicinity of the proposed project site may be exposed to two or more sources of construction related noise simultaneously. As discussed in Impact 4.9-1, the proposed project by itself would expose some receptors to noise levels in excess of acceptable City standards. Thus, the possibility exists that a substantial cumulative increase in construction noise levels could result from construction associated with the proposed project combined with other nearby projects. The cumulative impact of the proposed project and the related projects, concurrently emitting high levels of construction noise, would likely be significant and unavoidable. As discussed previously, the City exempts construction noise from the provisions of the Municipal Code as long as construction occurs within permitted hours of the day. Any potential the project analyzed in the cumulative context would be required to comply with the same provisions of the Municipal Code described above. Additionally, construction noise impacts are localized in nature and decrease substantially with distance. Consequently, all projects analyzed in the cumulative context would fall under the Municipal Code exemption, and the proposed project would comply with the noise-reducing requirements of mitigation measures BECSP MM4.9-1 through BECSP MM4.9-3. Therefore, the cumulative impact of the proposed project would be ***less than significant***.

4.9.5 References

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