5.7 NOISE

The generation of noise associated with the implementation of the Proposed Project would occur in the short term with site preparation and construction activities and over the long term from transportation related noise sources on new and existing development. This noise assessment addresses noise impacts by discussing the current noise environment, analyzing impacts associated with proposed land uses including mobile-source noise, evaluating construction equipment noise, and identifying mitigation measures and their effectiveness.

Characteristics of Sound

Sound is a pressure wave transmitted through the air. It is described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in Hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the loudness of sound is the decibel (dB). Changes of 1 to 3 dB are detectable under quiet, controlled conditions and changes of less than 1 dB are usually indiscernible. A change of 5 dB is readily discernable to most people in an exterior environment whereas a 10 dBA change is perceived as a doubling (or halving) of the sound. A change in noise levels of 3 dB is considered to be the minimum change in noise levels that is audible by human hearing in exterior noise environments.

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all and are "felt" more as a vibration. Similarly, while people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz. Since the human ear is not equally sensitive to sound at all frequencies, a special frequency dependent rating scale is usually used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Sound intensity is measured through the A-weighted measure to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies.

Noise is defined as unwanted sound, and is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, the Federal government, the State of California, and many local governments have established criteria to protect public health and safety and to prevent disruption of certain human activities.

Measurement of Sound

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. On a logarithmic scale, an increase of 10 dB is 10 times more intense than 1 dB, while 20 dB are 100 times more intense, and 30 dB are 1,000 times more intense. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source and their 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.” For a single point source, sound levels decrease by approximately 6 decibels for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance in a hard site environment.

Line source noise in a relatively flat environment with absorptive vegetation decreases by 4.5 dB for each doubling of distance. This latter value is also used in the calculation of railroad noise.

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time. Half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08} and L_{25} values represent the noise levels that are exceeded two, eight, and 25 percent of the time or 1, 5 and 15 minutes per hour. These "L" values are typically used to demonstrate compliance for stationary noise sources with a city's noise ordinance, as discussed below. Other values typically noted during a noise survey are the Lmin and Lmax. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, State law and the City of Anaheim require that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (Ldn). The CNEL descriptor requires that an artificial increment of 5 dBA be added to the actual noise level for the hours from 7 p.m. to 10 p.m. and 10 dBA for the hours from 10 p.m. to 7 a.m. The Ldn descriptor uses the same methodology except that there is no artificial increment added to the hours between 7 p.m. and 10 p.m. Both descriptors give roughly the same 24-hour level with the CNEL being only slightly more restrictive (i.e., higher). The Proposed Project identifies the use of the CNEL for environmental assessment. However, the General Plan also allows for a 12-hour Leq for sensitive land uses that are not occupied on a continual basis. This descriptor is actually more appropriate to those uses (e.g., schools, churches) that are not typically occupied at night, when noise levels are weighted to compensate for relaxation and sleep.

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 our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, and thereby affecting blood pressure, functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA could result in permanent hearing damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 190 dBA will rupture the eardrum and permanently damage the inner ear.

Vibration Fundamentals

Vibration is a trembling or oscillating motion of the earth. Like noise, vibration is transmitted in waves, but in this case through the earth or solid objects. Unlike noise, vibration is typically of a frequency that is felt rather than heard.

Vibration can be either natural as in the form of earthquakes, volcanic eruptions, sea waves, landslides, etc., or manmade as from explosions, the action of heavy machinery or heavy vehicles such as trains or construction equipment. Both natural and manmade vibration may be continuous such as from operating machinery, or transient as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways including displacement, velocity and acceleration. Particle displacement is a measure

of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Table 5.7-1 presents the human reaction to various levels of peak particle velocity.

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies. However, due to their suspension systems, buses often generate frequencies around 3 Hz at high vehicle speeds. It is more uncommon, but possible, to measure traffic frequencies above 30 Hz.

Table 5.7-1
Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (in/sec)	*Human Reaction*	*Effect on Buildings*
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans 2002.

The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborne vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provides by material damping varies with soil type and condition, as well as the frequency of the wave.

5.7.1 Environmental Setting

Methodology

The Proposed Project has the potential to generate noise and vibration from construction and operation related activities. Construction noise would be assessed based on data provided by the EPA. Construction generated vibration would be assessed based on methods provided by Caltrans.

The operational phase of the project would generate noise and vibration from vehicles travel. The FHWA Highway Traffic Noise Prediction Model, currently used throughout the United States, is used to evaluate traffic-related noise conditions in the Project Area. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the Community Noise Equivalent Level (CNEL) values. CNEL contours are derived through a series of calculations to determine the 60, 65, and 70 dBA CNEL contours associated with traffic noise generated on area roads. Project related vibration would also be generated by roadway vehicles. Vibration generated by project related roadway vehicles would also be assessed based on the vibration data provided by Caltrans.

Existing Noise Environment

Like all highly urbanized areas, the City of Anaheim is subject to noise from a myriad of sources. The major source of noise is from mobile sources and most specifically, traffic traveling through the City on its various roadways and freeways. Aircraft also contribute to this noise. The City is not located within the 65 dBA CNEL contours for any commercial or private airports, and fixed-wing aircraft are typically too high to add measurably to local noise. However, local helicopter air traffic is commonplace throughout the City and was noted in many instances during the field survey performed in drafting the General Plan Noise Element in 2004. In addition, both freight and commuter rail traffic pass through the City and noise generated along these rail lines can be substantially higher than in areas that are located away from the tracks. Noise from trains and their associated horns are a particular concern to those residents that live along these railroad corridors.

The City also includes a variety of stationary noise sources. These are primarily associated with industrial land uses, but also include fireworks displays put on at Disneyland on a regular basis and at Angel Stadium of Anaheim for special events. While the latter sources of noise are readily audible at proximate residential locations, they represent the existing setting. Furthermore, this noise is of short duration and as such, does not add substantially to the existing CNEL, which is based on a 24-hour, time-weighted average.

Field Survey

To ascertain the existing noise within the Project Area and to determine the percentages of automobiles and trucks for subsequent use in the generation of noise contours, The Planning Center conducted field monitoring on January 12, 13, and 20, 2005. A combination of 24-hour measurements and peak traffic hour measurements were obtained at various locations in the Project Area. The noise monitoring locations are shown in Figure 5.7-1. Additional details on the monitoring program are provided in Appendix H, *Noise Modeling Output*.

The field monitoring confirmed that most of the noise in the Project Area is due to the use of vehicles on public roadways. The Project Area is also subject to noise created by aircraft overflights and helicopters, which were noted during most of the field measurements. Other noise sources include the Union Pacific, the Burlington Northern Santa Fe (BNSF), Amtrak, and Metrolink railroad operations.

On-Road Vehicles

Noise from motor vehicles is generated by engine vibrations, the interaction between tires and the road, and the exhaust system. Reducing the average motor vehicle speed reduces the noise exposure of receptors adjacent to the road. Each reduction of five miles per hour reduces noise by about 1.3 dBA.

In order to assess the potential for mobile-source noise impacts, it is necessary to determine the noise currently generated by vehicles traveling through the Project Area. Average daily traffic (ADT) volumes were based on the existing daily traffic volumes provided by Parsons Brinckerhoff Quade & Douglas, Inc. The results of this modeling indicate that average noise levels along arterial segments currently range from approximately 65 dBA to about 75 dBA CNEL as measured at a distance of 50 feet from the centerline of the road. Lesser-traveled routes in areas that are currently underdeveloped are under 55 dBA CNEL, whereas noise levels near the freeways are projected at about 86 dBA CNEL as measured at a distance of 50 feet from the centerline of the road.

Railroad Noise

The Project Area includes the Atchison Topeka Santa Fe rail line which is owned by Burlington Northern Santa Fe (BNSF). The (BNSF) line is located in the northern portion of The Platinum Triangle and runs northwest-southeast. This railroad carries both passenger trains (Amtrak and Metrolink) and freight.

Railroad noise is dependant on the number of engines and railcars, the average speed, the percentage of operations that take place at night, the type of rails, and the presence of "at-grade" crossings that require the engineer to sound a warning horn. An at-grade crossing raises the noise produced by the engines by approximately 10 dBA. Ten times as many operations could occur if a horn were not sounded to achieve the same 10 dBA increase. Parsons Brinckerhoff Quade & Douglas reports that there are approximately 70 at-grade crossings throughout the City. The use of railroad warning signals is regulated at the Federal level and the City has limited authority to dictate railroad policy in this matter.

The BNSF does operate mainline activities through the northeastern portion of the City, primarily along Orangethorpe Avenue/Esperanza Road. Discussion with Lena Kent, BNSF Director of Public Affairs, noted that the line averages about 75 operations per day, including Metrolink operations. Metrolink operations account for 31 trains per day. Thus, BNSF operates approximately 44 trains a day along this corridor. Noise from these operations was modeled using the "Wyle" method as presented in The Noise Guidebook distributed by the Department of Housing and Urban Development (HUD). Modeling predicts that the 65 dBA Ldn noise contour falls at a distance of approximately 370 feet from the centerline of the tracks along the Orangethorpe Avenue/Esperanza Road corridor. This distance is extended to approximately 1,260 feet at crossings where a warning horn is sounded. In actuality, these distances would be considerably shorter as the intervening topography and structures would serve as noise berms and walls. The actual distance to the 65 dBA Ldn can only be determined on a case-by-case basis. (Note that railroad noise is based on the Ldn rather than CNEL descriptor. Because very few railroad operations occur between the hours of 7:00 p.m. and 10:00 p.m. [where the CNEL adds a 5 dBA penalty], both descriptors would yield similar results [within 0.2 dBA]).

The Anaheim Stadium Metrolink/Amtrak station is located adjacent to Angel Stadium of Anaheim south of Katella Avenue. Metrolink and Amtrak schedules show that the Orange County Line, passing through Anaheim Station currently has 45 operations with 10 occurring at night (i.e., between 10 p.m. and 7 a.m.). The "91 Line" adds an additional 10 operations, with one at night for a total of 55 operations with 11 at night. Using the Wyle method, the 65 Ldn falls at a distance of approximately 115 feet from the centerline of the rails cite GP. This distance is extended to approximately 465 feet at crossings. Again, actual distances to these contours could be shorter where topography or structures block the line of sight to the rails.

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Noise Monitoring Locations

Locations:

1. South State College Boulevard, south of Katella
2. 350 feet east of South State College Boulevard
3. South State College Avenue, south of Gene Autry Way
4. 350 feet west of South State College Boulevard
5. Katella Avenue, east of South State College Boulevard

NOT TO SCALE

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The Anaheim Canyon Station is currently serviced/passed by 22 operations with four occurring at night. These operations are joined by the "91 Line" and receptors located along the Inland Empire-Orange County corridor could experience 31 operations a day with eight at night for a total of 53 operations, with 12 at night. The distances to the 65 Ldn are modeled at approximately 70 feet and 250 feet at crossings requiring a warning signal.

Existing Policies and Regulations

To limit population exposure to physically and/or psychologically damaging, as well as intrusive noise levels, the Federal government, the State of California, various County governments, and most municipalities in the State have established standards and ordinances to control noise.

Federal Regulations

Federal Highway Administration

Six State Routes traverse the City of Anaheim: SR-91, SR-55, SR-57, SR-241, Beach Boulevard (SR-39), and Imperial Highway (SR-90). In addition, the I-5 Freeway runs through the City. These routes are subject to Federal funding and as such are under the purview of the Federal Highway Administration (FHWA). The FHWA has developed noise standards that are typically used for Federally funded roadway projects or projects that require either Federal or Caltrans review. These noise standards are based on Leq and L10 values.

The FHWA values are the maximum desirable values by land use type and area based on a "trade-off" of what is desirable and what is reasonably feasible. These values recognize that in many cases lower noise exposures would result in greater community benefits. The FHWA design noise levels are included in Table 5.7-2.

Table 5.7-2
FHWA Design Noise Levels

Activity Category	Design Noise Levels[1]		Description of Activity Category
	Leq (dBA)	L10 (dBA)	
A	57 (exterior)	60 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	70 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	75 (exterior)	Developed lands, properties, or activities not included in Categories A or B, above
D	—	—	Undeveloped lands.
E	52 (interior)	55 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

[1] Either Leq or L10 (but not both) design noise levels may be used on a project.
Source: FHWA

U.S. Environmental Protection Agency

In addition to FHWA standards, the United States Environmental Protection Agency (EPA) has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, a Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at a Leq of 55 dBA and interior levels at or below 45 dBA. While these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA also set 55 dBA Ldn as the basic goal for exterior residential noise intrusion. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA Ldn, have settled on the 65 dBA Ldn level as their standard. At 65 dBA Ldn, activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

Occupational Health and Safety Administration

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Such limitations would apply to the operation of construction equipment and could also apply to any proposed industrial land uses. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan, as required under OSHA, and is therefore not addressed further in this analysis.

US Department of Housing and Urban Development

The US Department of Housing and Urban Development (HUD) has set a goal of 65 dBA Ldn as a desirable maximum exterior standard for residential units developed under HUD funding. (This level is also generally accepted within the State of California.) While HUD does not specify acceptable interior noise levels, standard construction of residential dwellings constructed under Title 24 standards typically provides in excess of 20 dBA of attenuation with the windows closed. Based on this premise, the interior Ldn should not exceed 45 dBA.

Aircraft Noise Standards

The noise field study disclosed that the City is subject to aircraft overflight noise. While most fixed-wing aircraft are too high to be of consequence and the City is not located within the 65 dBA CNEL of any commercial airports, helicopters do regularly over fly the City and generate short-term noise. In fact, 8 of the 18 noise readings obtained over a period of two days included helicopter overflight noise.

The Federal Aviation Administration (FAA) regulates the noise from aircraft. The Aviation Safety and Noise Abatement Act of 1979 required that the FAA establish a single system for measuring and evaluating noise impacts. The FAA chose the Sound Exposure Level (SEL). The individual values of the SEL for each helicopter takeoff, landing, and flyovers are combined and compared against the community noise levels.

The FAA Advisory Circular Number 150-5020-2, entitled "Noise Assessment Guidelines for New Helicopters recommends the use of a cumulative noise measure, the 24-hour equivalent sound level (Leq(24)), so that the relative contributions of the heliport and other sound sources within the community may be compared. The Leq(24) is similar to the Ldn used in assessing the impacts of fixed wing aircraft. The helicopter Leq(24) values are obtained by logarithmically adding the single-event SEL values over a 24-hour period.

Public Law 96-193 also directs the FAA to identify land uses which are "normally compatible" with various levels of noise from aircraft operations. Because of the size and complexity of many major hub airports and

their operations, Federal Aviagion Regulation Part 150 identifies a large number of land uses and their attendant noise levels. However, since the operations of most heliports and helistops tend to be much simpler and the impacts more restricted in area, Part 150 does not apply to heliports/helistops not located on airport property. Instead, the FAA recommends exterior noise criteria for individual heliports based on the types of surrounding land uses. These recommended noise levels are included in Table 5.7-3.

The maximum recommended cumulative sound level (Leq(24)) from the operations of helicopters at any new site should not exceed the ambient noise already present in the community at the site of the proposed heliport. In other words, the Leq(24) should not exceed the values recommended in Table 5.7-3, or the locally measured ambient noise level.

Table 5.7-3
Normally Compatible Community Sound Levels

Type of Area	*Leq(24)*
Residential	
Suburban	57
Urban	67
City	72
Commercial	72
Industrial	77

Source: FAA Advisory Circular Number 150-5020-2, 1983

California State Regulations

Figure 5.7-2 on the next page presents a land use compatibility chart for community noise prepared by the California Office of Noise Control. It identifies normally acceptable, conditionally acceptable and clearly unacceptable noise levels for various land uses. 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.

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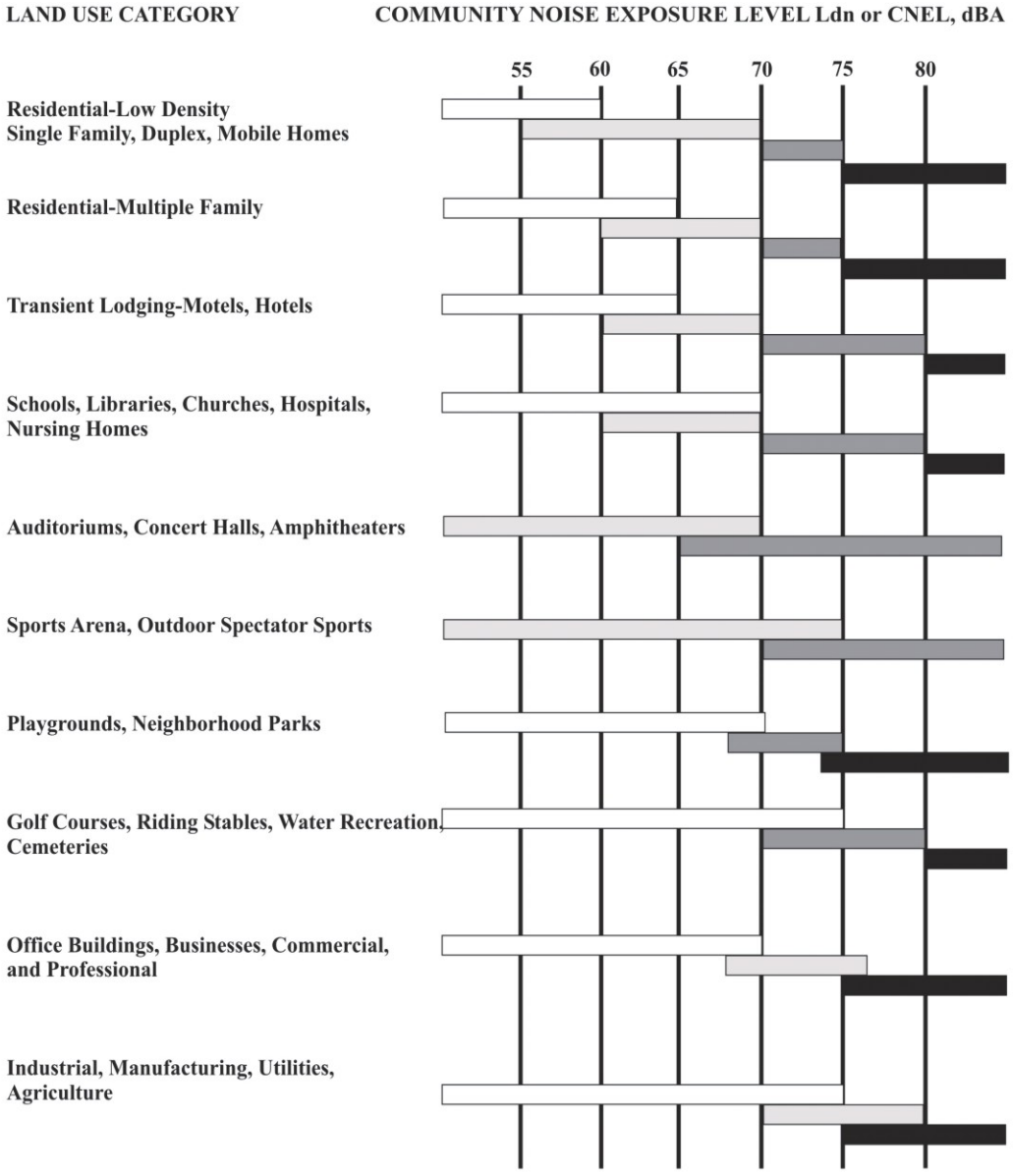
Land Use Compatibility for Community Noise Environments



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

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

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

Clearly Unacceptable:
New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: California Office of Noise Control

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City of Anaheim Noise Standards

The Proposed Project is subject to the City of Anaheim General Plan and Noise Ordinance incorporated therein. The City has adopted, as part of the Noise Element, the State of California standards as included in Figure 5.7-2 for planning of land use compatibility to noise. Furthermore, the Noise Element indicates that exterior noise levels at residential locations should not exceed a CNEL of 65 dB while interior levels shall not exceed a CNEL of 45 dB in any habitable room. The City has adopted, as part of the Noise Element, the State of California noise exterior and interior noise standards as shown in Table 5.7-4. Furthermore, the Noise Element indicates that exterior noise levels at residential locations should not exceed a CNEL of 65 dB while interior levels shall not exceed an annual CNEL of 45 dB in any habitable room. Stationary sources of noise are governed under the local Municipal Code, Chapter 6.70, *Sound Pressure Levels*. Section 6.70.010 simply states that "No person shall, within the City, create any sound, radiated for extended periods from any premises which produces a sound pressure level at any point on the property in excess of 60 dB (Re 0.0002 Microbar) read on the A-scale of a sound level meter. Readings shall be taken in accordance with the instrument manufacturer's instructions, using the slowest meter response." The section goes on to state "Traffic sounds, sound created by emergency activities and sound created by governmental units shall be exempt from the applications of this chapter. Sound created by construction or building repair of any premises within the City shall be exempt from the applications of this chapter during the hours of 7 a.m. and 7 p.m."

To minimize disturbance by construction noise, the City restricts noise intensive construction activities to the hours specified under Chapter 6.70 of the City of Anaheim Municipal Code (i.e., 7 a.m. to 7 p.m.). These hours shall also apply to any servicing of equipment and to the delivery of materials to or from the site. In addition, construction shall be restricted to weekdays and Saturdays between the hours of 7:00 a.m. and 7:00 p.m. Construction shall not be allowed any time on Sundays or Federally recognized holidays.

Table 5.7-4
State of California Interior and Exterior Noise Standards (CNEL)

Land Use		CNEL (dBA)	
Categories	**Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single- and Multi-family	453	65
	Mobile homes	—	654
Commercial	Hotel, motel, transient housing	45	—
	Commercial retail, bank, restaurant	55	—
	Office building, research and development, professional offices	50	—
	Amphitheater, concert hall, auditorium	45	—
	Gymnasium (multi-purpose)	50	—
	Sports club	55	—
	Manufacturing, warehousing, wholesale, utilities	65	—
	Movie theaters	45	—
Institutional/Public	Hospitals, school classrooms, playgrounds	45	65
	Church, library	45	—
Open Space	Parks	—	65

[1] Indoor environment excluding kitchens, bathrooms, toilets, closets and corridors
[2] Outdoor environment limited to: private yard of single-family dwellings; multiple-family patios or balconies accessed from within the dwelling (balconies 6 feet deep or less are exempt); mobile home parks; park picnic areas; school playgrounds; and hospital patios.
[3] Noise level requirements with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.
[4] Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

5.7.2 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-6 For a project within the vicinity of a private airstrip, expose people residing or working the Project Area to excessive noise levels.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant: This topic is not addressed in the following analysis.

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.

The applicable noise standards governing the Project Area are the City of Anaheim Noise Standards. Mobile sources of noise, such as aircraft, truck deliveries, railroad and aircraft operations, are exempt from local ordinance but are still subject to CEQA and would be significant if the project generates a volume of traffic that would result in a substantial increase in mobile source-generated noise or sites sensitive land uses in incompatible noise areas.

Noise impacts can be broken down into three categories. The first is “audible” impacts, which refers to increases in noise level that are perceptible to humans. Audible increases in noise levels generally refer to a change of 3 dBA or more since this level has been found to be barely perceptible in exterior environments. A change of 5 dBA is readily audible to most people in an exterior environment. The second category, “potentially audible,” refers to a change in noise level between 1 and 3 dBA. This range of noise levels was found to be noticeable to sensitive people in laboratory environments. The last category includes changes in noise level of less than 1 dBA that are typically “inaudible” to the human ear except under quiet conditions in controlled environments. Only “audible” changes in noise level are considered potentially significant.

Mobile-source noise (i.e., vehicle noise) is preempted from local regulation, but is still subject to CEQA. Here, a change of 5 dBA would denote a significant impact if their resultant noise level were to remain within the objectives of the General Plan (e.g., 65 dBA CNEL at a residential location), or 3 dBA if the resultant level were to meet or exceed the objectives of the General Plan. (Note that Caltrans defines a noise increase as substantial when the predicted noise levels with the project would exceed existing noise levels by 12 dBA Leq.) Also note that an impact is only potentially significant if it affects a receptor. An increase in noise in an uninhabited location would not denote a significant impact.

5.7.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in parentheses after the impact statement.

IMPACT 5.7-1: CONSTRUCTION ACTIVITES WOULD RESULT IN TEMPORARY NOISE INCREASES IN THE VICINITY OF THE PROPOSED PROJECT. (THRESHOLD N-3)

Impact Analysis: Noise is regulated by numerous codes and ordinances across Federal, State, and local agencies. The City regulates noise-generating activities through the Municipal Code. Specifically, noise generated during construction activities may have the potential to violate the City's Noise Ordinance and policies contained in the General Plan.

Construction Noise Impacts

The City recognizes that construction noise is difficult to control and restricts allowable hours for this intrusion. Section 6.70.010 of the City Municipal Code states that the sound created by construction or building repair of any premises within the City shall be exempt from the applications of the chapter between the hours of 7 a.m. and 7 p.m. Compliance with these provisions is mandatory and, as such, does not constitute mitigation under CEQA. Still, construction, even when restricted to within these hours, presents a nuisance value when conducted in proximity to sensitive receptors and the impact is considered as potentially significant.

Short-term noise impacts are impacts associated with demolition, site preparation, grading and construction of the proposed land uses. Two types of short-term noise impacts could occur during construction. 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 short-term noise impact is related to noise generated at the job site during demolition, site preparation, grading and/or building construction. Construction is performed in distinct steps, each of which has its own mix of equipment, and, consequently, its own noise characteristics. However, despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 5.7-5 lists typical construction equipment noise levels recommended for noise impact assessments as based on a distance of 50 feet between the equipment and a noise receptor.

Composite construction noise is best characterized by Bolt, Beranek and Newman (EPA December 31, 1971). In their study, construction noise for commercial and industrial development is presented as 89 dBA Leq when measured at a distance of 50 feet from the construction effort. Residential development is slightly quieter with a composite noise level of about 88 dBA Leq, again when measured at a distance of 50 feet from the construction effort. These values take into account both the number of pieces and spacing of the heavy equipment used in the construction effort. In later phases during building assembly, noise levels are typically reduced from these values and the physical structures further break up line-of-sight noise propagation.

Table 5.7-5
Noise Levels Generated by Typical Construction Equipment

Type of Equipment	Range of Sound Levels Measured (dBA at 50 ft)	Suggested Sound Levels for Analysis (dBA at 50 ft)
Pile Drivers, 12,000 to 18,000 ft-lb/blow	81 to 96	93
Rock Drills	83 to 99	96
Jack Hammers	75 to 85	82
Pneumatic Tools	78 to 88	85
Pumps	68 to 80	77
Dozers	85 to 90	88
Tractor	77 to 82	80
Front-End Loaders	86 to 90	88
Hydraulic Backhoe	81 to 90	86
Hydraulic Excavators	81 to 90	86
Graders	79 to 89	86
Air Compressors	76 to 86	86
Trucks	81 to 87	86

Source: Noise Control for Buildings and Manufacturing Plants," Bolt, Beranek and Newman, 1987.

Based on the 89 dBA Leq value, and assuming that construction were to occur for eight hours a day, the CNEL is calculated at 84 dBA at 50 feet (83 dBA CNEL for residential construction). The 65 dBA CNEL contour would fall at a distance of about 446 feet (397 feet for residential construction). The locations of construction for the developments envisioned by the Proposed Project would potentially expose noise sensitive uses such as the Grove of Anaheim (concert hall) or future residential uses to significant levels of short-term noise exposure from construction activities.

IMPACT 5.7-2 PROJECT IMPLEMENTATION WOULD RESULT IN NOISE INCREASES ASSOCIATED WITH THE LONG-TERM OPERATION OF THE PROJECT. (THRESHOLDS N-1 AND N-3)

Impact Analysis: Operational Impacts

On-Road Mobile-Source Noise Impacts on Existing Land Uses

Potential impacts on existing land uses stem mainly from the addition of project-generated vehicles along site access roads. Table 5.7-6 presents those routes with the potential for significant increase in noise due to growth anticipated under the Proposed Project. The table only considers those roads for which the City has existing 2005 data and, as such, all roads subject to potential impact may not be included in the table. The increase or decrease in noise along all routes is included in the Appendix H, *Noise Modeling Output*. As expected, the greatest increases are expected in those areas subject to increased land use intensity. The actual level of impact would depend on the presence and placement of any existing land uses. While an increase of 3 or 5 dBA is potentially significant, it is only significant if it impacts sensitive land uses. While adverse, noise increases in open-space or industrial areas would not be considered as significant.

The analysis, as performed, is required under CEQA and essentially assumes that the project would be built at one time and that the entirety of its traffic would be added to the existing volumes of traffic on the road. In actuality, project development would occur over a period of many years and the increase in noise over this period would not be readily discernable on a year-to-year basis.

Table 5.7-6
Build-out Traffic Volumes and Resultant Noise Levels Along Major Roadways Subject to Potentially Significant Change

Street Name	Segment	Existing Year 2005					Future Year 2025 With Project					Increase in Noise Levels (dBA CNEL)
		ADT Volumes	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)			ADT Volumes	50.0 CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)			
				60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)	
East-West Streets												
Orangewood Ave.	w/o SR-57	28,000	69.2	206	96	44	34,000	70.1	235	109	51	1
	w/o I-5 Fwy.	26,000	69	196	91	42	31,000	70	221	102	48	1
Connector Street	w/o Archstone	N/A	N/A	N/A	N/A	N/A	2,000	54	20	9	4	49
	w/o State College Blvd.	N/A	N/A	N/A	N/A	N/A	6,000	59	42	19	9	54
Gene Autry Way	w/o State College Blvd.	5,000	62	65	30	14	10,000	65	104	48	22	3
	w/o Market St.	N/A	N/A	N/A	N/A	N/A	16,000	67	142	66	31	62
Sportstown		N/A	N/A	N/A	N/A	N/A	10,000	61	59	27	13	56
Katella Avenue	w/o SR-57	46,000	71	287	133	62	56,000	72	327	152	71	1
	w/o Howell Ave.	35,000	70	239	111	52	54,000	72	320	148	69	2
	w/o State College Blvd.	32,000	70	225	105	49	62,000	73	350	163	75	3
	w/o Lewis Street	32,000	70	225	105	49	67,000	73	369	171	79	3
Sportstown		N/A	N/A	N/A	N/A	N/A	3,000	56	26	12	6	51
North-South Streets												
Archstone (proposed)	n/o Orangewood Ave.	N/A	N/A	N/A	N/A	N/A	4,000	57	32	15	7	52
State College Blvd.	n/o I-5 Fwy.	25,000	69	191	89	41	49,000	72	300	139	65	3
	n/o Connector St.	30,000	70	216	100	47	57,000	72	331	154	71	3
Sportstown (north)	n/o Sportstown	N/A	N/A	N/A	N/A	N/A	10,000	61	59	27	13	56
Market Street	n/o Connector St.	N/A	N/A	N/A	N/A	N/A	2,000	54	20	9	4	49
	n/o Gene Autry Way	N/A	N/A	N/A	N/A	N/A	4,000	57	32	15	7	52

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On-Road Mobile-Source Noise Impacts

An impact could be significant if the project sites sensitive land uses in areas that do not meet the environmental goals of the City for the area in which they are to be situated. As noted in the prior discussion, for the purposes of this analysis, impacts on sensitive areas are considered significant if a CNEL of 65 dBA (Leq(12) for sensitive land uses not occupied on a 24-hour basis) is met or exceeded. These standards shall then serve as the basis of the impact analysis.

There are several areas in the City where the 65 dBA CNEL noise contours overlap onto proposed residential areas. This is especially true in those areas that lie near the freeways. Any siting of sensitive land uses within these contours then represents a potentially significant impact and would require a separate noise study through the development review process to determine the level of impacts and required mitigation.

Railroad Noise Impacts

Though the Proposed Project would not result in directly substantially increasing the number of train events, the primary noise impact related to railroad noise is related to placement of project related noise sensitive receivers in areas of substantial train noise.

The Anaheim Stadium Metrolink/Amtrak Station is located adjacent to Angel Stadium of Anaheim south of Katella Avenue. Parsons Brinckerhoff estimates that rail traffic would increase by roughly 160 percent along the Orange County Line running through the Anaheim station. Existing operations along this line are estimated to create a noise level of 61.5 dB Ldn as measured at a distance of 200 feet from the rail. At-grade crossings would increase this value to approximately 63.5 dBA Ldn, again as measured at a distance of 200 feet. Future operations would raise the noise levels by approximately 2 dBA Ldn.

These planned operations would extend the 65 dBA Ldn noise contour to a distance of approximately 160 feet. Grade crossings raise the existing Ldn to approximately 70.5 dBA, and future operations could further raise this value by approximately 2 dBA Ldn, resulting in a value of approximately 72.5 dBA Ldn as measured at a distance of 200 feet from the crossing. The 65 dBA Ldn value would be extended to a distance of approximately 630 feet. An impact would be potentially significant if new sensitive land uses were to be located within these distances. Any siting of sensitive land uses within these contours then represents a potentially significant impact and would require a separate noise study through the development review process to determine the level of impacts and required mitigation.

Industrial Stationary-Source Noise Impacts

Potential noise exposure impacts may occur if project related noise sensitive uses are placed proximate to stationary noise sources such as industrial uses. Industrial land uses may increase noise levels in their proximity. This can be due to the continual presence of heavy trucks used for the pick-up and delivery of goods and supplies, or from the use of noisy equipment used in the manufacturing or machining process. While vehicle noise is exempt from local regulation while operating on public roadways, for the purposes of the planning process, this noise may be regulated as a stationary-source while operating on private property. The Planning Center personnel documented noise associated with idling trucks at the Consolidated Volume Transfer Station and Recycling Facility (CVT) located at 1071 North Blue Gum Street in Anaheim. Equipment used in the CVT study is as described below.

The measurement obtained at the CVT Transfer Station was obtained to determine the noise generated by heavy trucks as they queue up and are weighed prior to dumping their loads. Two weigh scales are situated on either side of a scale house at the CVT facility. The meter was placed to the side of the trucks where engine noise is most prominent. The unit was situated at a distance of 50 feet from the side of the near truck. This placed the meter at the opening of a maintenance shop such that the reading was taken between the

refuse room and maintenance shop area. (This would tend to produce elevated noise readings as the sound reverberates between the two sets of structures.) A "green waste" processing area was located to the side of the meter at a distance of about 150 feet. "Yard" activities included trucks queuing up (approximately six at a time) and being weighed, and a bucket loader tending to the green wastes. A 15-minute measurement was made beginning at 10:08 a.m. An Leq of 73.0 dBA was registered.

Based on the measurement obtained at the CVT facility, this analysis assumes that heavy trucks produce a level of approximately 73 dBA Leq as measured at a distance of 50 feet from the noisiest portion of the truck (i.e., to the side with the engine exposed). The use of multiple trucks could generate noise levels on the order of 80 dBA Leq; again as measured at a distance of 50 feet. Process equipment and the use of pneumatic tools could also generate elevated noise levels, but this equipment is typically housed within the facilities and would not be expected to exceed the 80 dBA Leq projected for exterior trucks.

If it is assumed that the 80 dBA Leq level were produced continually for a period of eight hours during the day, the calculated CNEL is 75 dBA as measured at a distance of 50 feet. The 65 dBA CNEL would fall at a distance of 158 feet.

The Proposed Project includes residential and commercial uses in The Platinum Triangle area which may be developed in close proximity or adjacent to industrial uses and may be impacted significantly if these residences are located in close proximity to industries that emit substantial levels of noise. Any siting of sensitive land uses within these contours then represents a potentially significant impact and would require a separate noise study through the development review process to determine the level of impacts and required mitigation.

IMPACT 5.7-3: THE PROJECT MAY INCREASE GROUNDBORNE VIBRATION AND GROUNDBORNE NOISE. (THRESHOLD N-2)

Impact Analysis: Build-out of the Proposed Project could potentially expose vibration sensitive uses such as residences to the impacts of groundborne vibration or noise levels. Increased exposure could occur through increased vibration sensitive uses on lands within proximity to vibration generating activities. Specifically, vibration created through construction and industrial activities or through the operation of motor vehicles and railways could create potentially significant impacts on the residents of The Platinum Triangle.

Construction Vibration Impacts

An aspect of construction is its accompanying vibration. Excessive groundborne vibration is typically caused by activities such as blasting, or the use of pile drivers during construction. Construction under the Proposed Project is not anticipated to require blasting activities, but pile driving could occur and produce vibration that could be felt at nearby land uses. These vibrations pose not only a nuisance, but also a risk to proximate structures.

As a reasonable worst-case scenario, an impact pile driver, which would generate greater vibrations, is assumed. While the City has no vibration standards, Caltrans sets the criterion level for pile driving at between 0.2 and 2 inches per second (in/sec). A reasonable worst-case scenario assumes the use of the 0.2 in/sec criterion. Caltrans presents the vibration produced by a 50,000 foot-pound force with distance for both clayey and sandy/silt soils as a function of distance. Caltrans indicates that the distance to the 0.2 in/sec minimum criterion falls at a distance of approximately 50 feet. Still, like construction, pile driving carries a high nuisance factor, and vibration related to pile-driving activities is considered as potentially significant if these activities are performed within 200 feet of any permanent structures. As such, potential construction related vibration impacts may occur if project related construction activities involve vibration intensive activities proximate to vibration sensitive receivers.

Operational Vibration Impacts

On-Road Mobile-Source Vibration Impacts

Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses. Caltrans notes that "heavy trucks, and quite frequently buses, generate the highest earthborne vibrations of normal traffic." Caltrans further notes that the highest traffic generated vibrations are along the freeways. Their study finds that vibrations measured on freeway shoulders (5 meters from the centerline of the nearest lane) have never exceeded 0.08 in/sec, with the worst combinations of heavy trucks. This level coincides with the maximum recommended "safe level" for ruins and ancient monuments (and historic buildings). Because sensitive land uses are not and will not be sited within this distance, any potential for significant vibration impacts is less than significant.

Railroad Vibration Impacts

Caltrans has studied the effects of propagation of train vibration on sensitive land uses and notes that train vibration levels may be quite high, depending on the speeds, load, condition of track, and amount of ballast used to support the track. Caltrans obtained measurement of train vibrations and using their highest recorded value, prepared a "drop-off curve." The curve represents the maximum expected levels from trains, and is considered by Caltrans to be "very conservative." The curve demonstrates that the 0.08 in/sec level, the maximum recommended "safe level" for ruins and ancient monuments and used here as a significance threshold, occurs at a distance of 25 feet from the rails. The 0.2 in/sec level, at which there is a risk of architectural damage, occurs at a distance of about 7.5 feet from the rails. Because sensitive land uses are not and will not be sited within these distances, any potential for significant vibration impacts is less than significant.

Industrial Vibration Impacts

The use of heavy equipment (e.g., stamping tools) associated with industrial operations can create elevated vibration levels in their immediate proximity. While the level of this vibration is indeterminate, it certainly would not be expected to exceed that of railroad operations. Railroad operations are shown to create vibration levels under the most stringent Caltrans threshold levels at a distance of 25 feet from the rails. Any pieces of heavy vibration-causing equipment would be situated in excess of this distance from any sensitive land uses and any potential for impact is less than significant.

IMPACT 5.7-4: THE PROXIMITY OF THE PROJECT SITE TO EXISTING HELIPORTS WOULD RESULT IN EXPOSURE OF FUTURE RESIDENTS AND WORKERS TO HELIPORT-RELATED NOISE. (THRESHOLDS N-5, N-6)

Impact Analysis: Several heliports within the City of Anaheim are utilized for helicopter take-off and landing. According to the Department of Transportation, Division of Aeronautics, the City of Anaheim contains five heliports. These include two heliports associated with the Anaheim Police Department (police use), Boeing Anaheim B/250 (corporate use), Boeing Heliport/Building 203 (corporate use), and North Net Fire Training Center (fire department use). There are no private airstrips within the City.

The Airport Land Use Commission's (ALUC) was established to ensure that there are no direct conflicts with land uses, noise, or other issues that would impact the functionality and safety of airport and heliport operations. The ALUC requires that cities and counties general plans and zoning ordinances are consistent with Airport Environs Land Use Plans (AELUPs), which contain noise contours, restrictions for types of construction and building heights in navigable air space, as well as requirements impacting the establishment or construction of sensitive uses within close proximity to airports. The ALUC has established an AELUP that addresses heliport operations within cities and counties, and which are applicable to the City of Anaheim.

5.7.4 Cumulative Impacts

As shown in Table 5.7-6, cumulative noise level increases associated with the Proposed Project would range from 1 to 3 dBA CNEL for roadways that currently exist; however, some roadways will exceed the City's 65 CNEL outdoor noise standard. This would be mitigated through compliance with the City's Noise Ordinance. As a result, no significant cumulative noise impacts are anticipated.

5.7.5 Existing Regulations and Standard Conditions

- The City shall restrict noise intensive construction activities to the hours specified under Chapter 6.70, *Sound Pressure Levels*, of the City of Anaheim Municipal Code (i.e., 7:00 a.m. to 7:00 p.m.). These hours shall also apply to any servicing of equipment and to the delivery of materials to or from the site. In addition, construction shall be restricted to weekdays and Saturdays between the hours of 7:00 a.m. and 7:00 p.m. Construction shall not be allowed any time on Sundays or Federally recognized holidays.

- Stationary sources of noise are governed under the Anaheim Municipal Code, Chapter 6.70, *Sound Pressure Levels*. Section 6.70.010 simply states that "No person shall, within the City, create any sound, radiated for extended periods from any premises which produces a sound pressure level at any point on the property in excess of sixty decibels (Re 0.0002 Microbar) read on the A-scale of a sound level meter. Readings shall be taken in accordance with the instrument manufacturer's instructions, using the slowest meter response." The section goes on to state, "Traffic sounds, sound created by emergency activities and sound created by governmental units shall be exempt from the applications of this chapter. Sound created by construction or building repair of any premises within the City shall be exempt from the applications of this chapter during the hours of 7:00 a.m. and 7:00 p.m."

5.7.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, all the potential noise impacts being evaluated may result in significant noise impacts. Because the Proposed Project encompasses a large area with numerous proposed developments, the potential for noise or vibration impacts is dependant on the proximity of noise or vibration sensitive uses to sources of noise or vibration. As such, Impact 5.7-1 (Construction Noise) could result in significant impacts to noise sensitive receivers if construction activities occur proximate to noise sensitive receivers. Impact 5.7-2 (long-term noise increases or exposure) may potentially result in significant noise impacts from the placement of noise sensitive uses in areas of high noise exposure from transportation (roadway, rail, or heliport) or stationary sources (industrial). Basd on the preceding analysis, Impact 5.7-3 (vibration) would not result in significant vibration impacts. Impact 5.7-4 (heliport noise) may result in significant impacts to noise if project related noise sensitive receivers are located near heliports or areas of helicopter activity.

5.7.7 Mitigation Measures

Applicable Mitigation Measures from MMP No. 106

The following mitigation measures were included in Mitigation Monitoring Program No. 106 for The Platinum Triangle, and were previously adopted as part of the Stadium Area Master Land Use Plan EIR and the General Plan and Zoning Code Update EIR No. 330. Some of these measures are being revised as part of this Subsequent EIR. Additions are shown in **bold** and deletions are indicated in strikeout format.

5.7-1 On-going and 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:**

a) Noise generated by construction, shall be limited by the property owner/developer to 60 dBA along the property boundaries, before 7 a.m. and after 7 p.m., as governed by Chapter 6.7, Sound Pressure Levels, of the Anaheim Municipal Code.

~~5.7-2~~ **b)** Limit the hours of operation of equipment that produces noise levels noticeably above general construction noise levels to the hours of 10 a.m. to 4 p.m.

~~5.7-3~~ **c)** All internal combustion engines on all of the construction equipment shall be properly outfitted with well maintained muffler systems.

5.7.2 Prior to issuance of a building permit for any project generating over 100 peak hour trips, the project property owner/developers shall submit a final acoustical report prepared to the satisfaction of the Planning Director. The report shall show that the development will be sound-attenuated against present and projected noise levels, including roadway, aircraft, helicopter and railroad, to meet City interior and exterior noise standards.

~~5.7.3~~ New development project property owner/developers shall use the most current available Airport Environs Land Use Plan (AELUP) as a planning resource for evaluating heliport and airport operations as well as land use compatibility and land use intensity in the proximity of Los Alamitos Joint Training Base and Fullerton Municipal Airport.

Additional Mitigation

No additional mitigation measures are required.

5.7.8 Level of Significance After Mitigation

The mitigation measures identified above would reduce potential impacts associated with noise and vibration to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to noise have been identified.

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