5.4 NOISE

This section evaluates potential noise and vibration impacts associated with implementation of the Proposed Project. This section discusses the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; reviews noise levels at existing receptor locations; and evaluates potential noise impacts associated with the Proposed Project. This evaluation uses procedures and methodologies as specified by the California Department of Transportation (Caltrans), the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA). The analysis in this section is based on the following:

Noise Technical Study for: The Honda Center, The Planning Center|DC&E, January 2012.

A complete copy of this study is included in Appendix D to this EIR.

5.4.1 Environmental Setting

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

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

- ***Noise.*** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- ***Decibel (dB).*** A unitless measure of sound on a logarithmic scale.
- ***A-Weighted Decibel (dBA).*** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- ***Equivalent Continuous Noise Level (L_{eq}).*** The mean of the noise level averaged over the measurement period, regarded as an average level.
- ***Day-Night Level (L_{dn}).*** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.
- ***Community Noise Equivalent Level (CNEL).*** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

Characteristics of Sound

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

A-weighted filter system is used to adjust measured sound levels. In terms of loudness, the normal range of human hearing extends from approximately 0 dBA to 140 dBA.

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. Because of the physical characteristics of noise transmission and noise perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 5.4-1, *Change in Sound Pressure Level*, presents the subjective effect of changes in sound pressure levels.

Table 5.4-1
Change in Sound Pressure Level

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

Source: Bies and Hansen 2003.

Sound is generated from a source and dissipates exponentially with distance from that source. This phenomenon is known as "spreading loss."

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with such measurements. The L_{eq} metric is a single-number noise descriptor that represents the average sound level over a given period of time. For example, the L_{50} noise level represents the level that is exceeded 50 percent of the time. Half the time the noise exceeds this level and half the time it is less than this level. This level also represents 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 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. Other values typically noted during a noise survey are the L_{min} and L_{max}. 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 requires that, for planning purposes, an artificial dB increment be added to quiet-time noise levels in a 24-hour noise descriptor, the CNEL or L_{dn}.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire biological system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and nervous system. Extended periods of noise exposure above 90 dBA result in permanent cell 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, called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas. Table 5.4-2 shows typical noise levels from various noise sources.

Table 5.4-2
Typical Noise Levels from Noise Sources

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

Source: California Department of Transportation Table 9-2136.2 1998.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment, such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is described as the velocity, and the rate of change of the speed is described as the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During the construction of a building, the operation of construction equipment could cause groundborne vibration. The three main wave types of concern in the propagation of groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

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

- Compression or P-waves are body waves that carry their energy along an expanding spherical wave

front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.

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

The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal and RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units to compress the range of numbers required to describe the vibration. All PPV and RMS velocity are in in/sec and all vibration levels in this study are in dB relative to one microinch per second (abbreviated as VdB). The threshold of perception is approximately 65 VdB. Typically groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Man-made vibration problems are usually confined to short distances (500 feet or less) from the source.

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

Regulatory Framework

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. The City of Anaheim regulates noise through the City of Anaheim Municipal Code and General Plan. Potential noise impacts were evaluated based on the City of Anaheim Municipal Code and General Plan to determine whether a significant adverse noise impact would result from the operation of the Proposed Project.

Table 5.4-3
Community Noise and Land Use Compatibility

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

Explanatory Notes

Normally Acceptable:
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/development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. 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/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/development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be useable.

Source: City of Anaheim, City of Anaheim General Plan, Chapter 9, Noise Element. Adopted May 2004.

California State Regulations

State of California Building Code

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

Land Use Compatibility

Table 5.4-3 presents a land use compatibility chart for community noise adopted by the City of Anaheim's General Plan Noise Element. This table provides urban planners with a tool to gauge the compatibility of new land uses relative to existing and future noise levels. This table identifies normally acceptable, conditionally acceptable, normally unacceptable, 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.

City of Anaheim Noise Standard

Stationary Noise Nuisance

The City of Anaheim regulates noise through the City of Anaheim's Municipal Code, Chapter 6.70, Sound Pressure Levels. Pursuant to the municipal code, the City restricts noise levels generated at a property from exceeding 60 dBA for extended period of time. The City applies these standards to nontransportation stationary noise sources. These standards do not gauge the compatibility of developments in the noise environment, but provide restrictions on the amount and duration of noise generated at a property, as measured at the property line of the noise receptor. The City's noise ordinance is designed to protect people from objectionable nontransportation noise sources such as music, construction activity, machinery, pumps, and air conditioners.

Construction Noise

The City of Anaheim exempts noise generated by construction or building repair from the noise limits of the City's Municipal Code for the purpose of allowing such activities to occur. Pursuant to Chapter 6.70, Sound Pressure Levels, construction is permitted between the hours of 7:00 AM and 7:00 PM.

Existing Noise Environment

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 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 Brinkerhoff (2012). Noise levels for existing conditions (without and with average attendance event) along analyzed roadways are presented in Table 5.4-4. The results of this modeling indicate that current average noise levels along arterial segments for a typical day without an event range from approximately 63.4 to 77.3 dBA CNEL at 50-feet from the roadway centerline. Average noise levels along the arterial segments range from 65.3 to 77.5 dBA CNEL at 50-feet from the roadway centerline on a day with an event (based on nan average attendance event).

Table 5.4-4
Existing Ambient Noise Environment

Location	Existing No Event		Existing with Average Attendance Event		Increase in CNEL (dBA) from Events
	ADT	CNEL[1]	ADT	CNEL[1]	
Ball Road					
Between Sunkist St and SR-57 SB Ramp	50,970	77.2	52,630	77.3	0.1
Between SR-57 SB Ramp and Phoenix Club Dr	31,670	75.1	33,730	75.4	0.3
Cerritos Avenue					
Between Sunkist St and Douglass Rd	4,270	66.4	5,780	67.7	1.3
Douglass Road					
Between Katella Ave and Cerritos Ave	7,040	67.6	10,120	69.2	1.6
Katella Avenue					
Between Lewis Street and State College Blvd	33,500	75.4	34,120	75.4	0.0
Between State College Blvd and Howell Ave	34,130	75.4	35,310	75.6	0.2
Between Howell Ave and SR-57 SB Ramps	52,030	77.3	55,550	77.5	0.2
Between SR-57 SB Rmps and SR-57 NB Rmps	34,720	75.5	38,170	75.9	0.4
Between SR-57 NB Ramps and Douglass Rd	34,470	75.5	39,970	76.1	0.6
Between Douglass Rd and Struck Ave	29,480	74.8	32,820	75.3	0.5
Between Struck Ave and Main St	23,170	73.8	24,840	74.1	0.3
Between Main St and Batavia St	25,630	74.2	26,630	74.4	0.2
Main Street					
Between Katella Ave and Struck Ave	15,000	71.9	15,640	72.4	0.5
Phoenix Club Drive					
Between Honda Center and Ball Rd	3,470	63.4	5,220	65.3	1.9
State College Boulevard					
Between Howell Ave and Katella Ave	21,030	73.3	21,590	73.5	0.2
Sunkist Street					
Between Cerritos Ave and Ball Rd	6,790	68.4	7870	69.1	0.7

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.

[1] Noise levels are calculated at 50 feet from the roadway centerline.

[2] The "Increase from Existing No Event" is the difference in traffic noise between the existing year without event and average attendance event and represents the increase in noise attributable to event-related traffic.

Noise-Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration, including residential, school, and open space/recreation areas where quiet environments are necessary for enjoyment, public health, and safety. The project site is primarily surrounded by commercial and light industrial land uses, and the Angel Stadium of Anaheim is located to the southwest, these uses are not considered noise sensitive. The nearest noise-sensitive receptors to the project site are:

- Westwood College. Generally located northwest of the project site across Douglass Road.
- Ayres Hotel of Anaheim. Located south of the project site across Katella Avenue.
- Sunkist Gardens Mobile Home Park. Located approximately 1,675 feet to the northwest of the project site.

5.4.2 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.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

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

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

These impacts will not be addressed in the following analysis.

City of Anaheim Thresholds

There are two criteria for judging noise impacts used in this analysis. First, noise levels projected for the Proposed Project must comply with all relevant state and local standards and regulations. Noise impacts on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints

and subsequent investigation. The second measure of impact used in this analysis is whether the increase in noise above the ambient noise level, as a result of a new noise source (either through on-site emissions or through noise generated by project traffic), has the potential to adversely impact noise-sensitive land uses.

Substantial Increase in Traffic Noise Levels

The traffic noise thresholds are based on human tolerance to noise (see Table 5.4-1, shown previously) and are widely used for assessing traffic noise impacts. In general, people tend to compare intruding noise with the existing background noise. If the new noise is readily identifiable or considerably louder than the background, it has the potential to be objectionable or annoying (2009). Noise impacts can be broken down into three categories. The first is audible impacts. Audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change of between 1 and 3 dBA. This range of noise levels was found to be noticeable to sensitive people in laboratory environments. The last category, inaudible, includes changes of less than 1 dBA, which are typically inaudible to the human ear except under quiet conditions in controlled environments. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving of sound level. Only audible changes of 3 dBA or greater in noise levels at sensitive receptors are considered potentially significant when noise levels exceed the compatibility criteria (see Table 5.4-3, shown previously). Based on the City of Anaheim's noise compatibility criteria of 60 dBA CNEL for residential uses, the City considers audible (3+ dBA) increases in project-related traffic noise to be substantial when the ambient noise environment along the roadway segments within the project's study area under with project conditions exceeds 60 dBA CNEL.

Stationary-Source Noise

The stationary noise thresholds are based on a combination of the human tolerance to noise (see Table 5.4-3) and local criteria for stationary noise sources as established by the City of Anaheim for noise control (Anaheim Municipal Code, Chapter 6.70, Sound Pressure Levels). Pursuant to the municipal code, the City restricts noise levels generated at a property from exceeding 60 dBA L_{eq} for extended period of time.

Construction

The City of Anaheim's Noise Ordinance regulates the timing of construction activities. No construction shall be permitted outside of the hours specified in the City of Anaheim's Municipal Code. The City of Anaheim restricts construction activities to the daytime hours of 7:00 AM and 7:00 PM. The potential for construction noise impacts to be objectionable depends on the magnitude of noise generated by the construction equipment, the frequency of noise sources during the construction day, and total duration of construction activities.

5.4.3 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 brackets after the impact statement.

IMPACT 5.4-1: BUILD-OUT OF THE PROPOSED PROJECT WOULD NOT 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. [THRESHOLDS N-1 AND N-3]

Impact Analysis: Unlike transportation noise sources, whose effects can extend well beyond the limits of the project site, stationary noise only impacts sensitive receptors adjacent to a project site. Stationary sources of noise include mechanical equipment (HVAC systems) and parking lots. The Proposed Project would not introduce any new or different stationary sources of noise at the project site compared to the types of noise currently generated during a permitted event at the Honda Center. Installation of additional mechanical systems or expansion of the parking lots would not be required. The City of Anaheim restricts stationary noise generated on a property from creating a nuisance to other offsite noise-sensitive receptors through implementation of the noise limits in the City's municipal code. The proposed project would add an approximate 5,846 square foot restaurant to serve event attendees, a 5,846 square foot team store and a 9,114 square feet open area on the Main Level (Level 200); and above the main level improvements, a 9,518 square feet restaurant to serve event attendees and a 12,436 square foot outdoor terrace on the Club Level (Level 300). Other interior improvements include locker room, office space, bunker suite and balcony suite renovations; electrical upgrades and an increase in the capacity of the loading dock. There would be no new HVAC units or an expansion of the parking lot as part of the project. While the project may increase parking utilization and cause a marginal increase in the utilization of existing HVAC units, these changes are minimal and therefore the project would not cause discernable noise increases to any noise-sensitive use. No mitigation measures would be required.

IMPACT 5.4-2: BUILD-OUT OF THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL TEMPORARY OR PERMANENT INCREASES IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT. [THRESHOLDS N-3 AND N-4]

Impact Analysis: The operations phase of the project would generate noise primarily associated with vehicular trips. Traffic noise modeling is based on average daily traffic volumes on roadway segments within the analysis conducted by Parsons Brinkerhoff (2012).

2011 Existing Traffic Noise plus Project (Sellout Event)

Traffic noise modeling was compiled for year 2011No Event and 2011 Plus Project (sellout event), and shown in Table 5.4-5. The significance criteria for roadway noise impacts are based on whether the proposed project would result in a substantial increase (3 dB or more) in the ambient noise environment along the roadways when the ambient noise environment exceeds 60 dBA CNEL (daily noise levels). The proposed project would result in similar noise levels along the roadways within the study area of the project, and no traffic noise impacts due to the project would occur.

2013 Traffic Noise with Project Event

Traffic noise modeling was compiled for year 2013 with an average attendance event and then compared to a sellout event and shown in Table 5.4-6. The Proposed Project would increase the number of events from an average of 153 events to a maximum of 222 events per year. The significance criteria for roadway noise impacts are based on whether the Proposed Project would result in a substantial increase (3 dB or more) in the

ambient noise environment along the roadways when the ambient noise environment exceeds 60 dBA CNEL (daily noise levels). While the number of Honda Center events would increase from an average of 3 events per week to an average of 4 events per week, average daily noise levels generated by a sellout event would not cause substantial noise increases . The Proposed Project would result in noise levels increases along the roadways within the study area of the project below significance levels, and no traffic noise impacts would occur under 2013 conditions.

Table 5.4-5
Year 2011 Traffic Noise Levels

Location	Existing No Event CNEL	Year 2011 Plus Project (Sellout Event)		
		ADT	CNEL[1]	Increase [2]
Ball Road				
Between Sunkist St and SR-57 SB Ramp	77.2	53,760	77.4	0.2
Between SR-57 SB Ramp and Phoenix Club Dr	75.1	35,140	75.6	0.5
Cerritos Avenue				
Between Sunkist St and Douglass Rd	66.4	6,800	68.4	2.0
Douglass Road				
Between Katella Ave and Cerritos Ave	67.6	12,220	70.0	2.4
Katella Avenue				
Between Lewis Street and State College Blvd	75.4	34,540	75.5	0.1
Between State College Blvd and Howell Ave	75.4	36,110	75.7	0.3
Between Howell Ave and SR-57 SB Ramps	77.3	57,930	77.7	0.4
Between SR-57 SB Ramps and SR-57 NB Ramps	75.5	40,500	76.2	0.7
Between SR-57 NB Ramps and Douglass Rd	75.5	43,690	76.5	1.0
Between Douglass Rd and Struck Ave	74.8	35,090	75.6	0.8
Between Struck Ave and Main St	73.8	25,970	74.2	0.4
Between Main St and Batavia St	74.2	27,310	74.5	0.3
Main Street				
Between Katella Ave and Struck Ave	71.9	16,080	72.2	0.3
Phoenix Club Drive				
Between Honda Center and Ball Rd	63.4	6,410	66.1	2.7
State College Boulevard				
Between Howell Ave and Katella Ave	73.3	21,970	73.5	0.2
Sunkist Street				
Between Cerritos Ave and Ball Rd	68.4	8,600	69.4	1.0

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.
Bold: Audible (+3 dB) changes in the ambient noise environment from traffic noise.
[1] Noise levels are calculated at 50 feet from the roadway centerline.
[2] The "Increase" is the difference in traffic noise between Existing No Event and Year 2011 Plus Project (sellout event) conditions and represents the change in traffic noise levels from the project.

Table 5.4-6
Year 2013 Traffic Noise Levels

Location	2013 No Event	Year 2013 Average Attendance Event		Year 2013 with Project (Sellout Event)		Increase in CNEL (dBA)	
		ADT	CNEL[1]	ADT	CNEL[1]	from Existing No Event[2]	from Average Event[3]
Ball Road							
Between Sunkist St and SR-57 SB Ramp	77.2	57,730	77.7	58,860	77.8	0.6	0.1
Between SR-57 SB Ramp and Phoenix Club Dr	75.1	36,900	75.8	38,310	75.9	0.8	0.1
Cerritos Avenue							
Between Sunkist St and Douglass Rd	66.4	6,210	68.0	7,230	68.7	2.3	1.8
Douglass Road							
Between Katella Ave and Cerritos Ave	67.6	10,820	69.5	12,920	70.2	2.6	0.7
Katella Avenue							
Between Lewis Street and State College Blvd	75.4	37,470	75.8	37,890	75.9	0.5	0.1
Between State College Blvd and Howell Ave	75.4	38,720	76.0	39,520	76.1	0.7	0.1
Between Howell Ave and SR-57 SB Ramps	77.3	60,750	77.9	63,130	78.1	0.8	0.2
Between SR-57 SB Ramps and SR-57 NB Ramps	75.5	41,640	76.3	43,970	76.5	1.0	0.2
Between SR-57 NB Ramps and Douglass Rd	75.5	43,420	76.5	47,140	76.8	1.3	0.3
Between Douglass Rd and Struck Ave	74.8	35,770	75.6	38,040	75.9	1.1	0.3
Between Struck Ave and Main St	73.8	27,160	74.4	28,290	74.6	0.8	0.2
Between Main St and Batavia St	74.2	29,190	74.8	29,870	74.9	0.7	0.1
Main Street							
Between Katella Ave and Struck Ave	71.9	17,140	72.4	17,580	72.6	0.7	0.2
Phoenix Club Drive							
Between Honda Center and Ball Rd	63.4	5,570	65.4	6,760	66.3	2.9	0.9
State College Boulevard							
Between Howell Ave and Katella Ave	73.3	23,690	73.8	24,070	73.9	0.6	0.1
Sunkist Street							
Between Cerritos Ave and Ball Rd	68.4	8,550	69.4	9,280	69.8	1.4	0.4

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.

Bold: Audible (+3 dB) changes in the ambient noise environment from traffic noise.

[1] Noise levels are calculated at 50 feet from the roadway centerline.

[2] The "Increase from Existing No Event" is the difference in traffic noise between the existing year without event and Year 2013 with project (sellout event) and represents the overall increase in cumulative noise.

[3] The "Increase from Average Event" is the difference in traffic noise between Year 2013 with average attendance event and Year 2013 with project (sellout event) conditions and represents the change in noise traffic noise levels from event traffic.

Year 2030 with Project Events

Traffic noise increases associated with the Proposed Project were also assessed under future Year 2030 with the buildout of the General Plan and are shown in Table 5.4-7. Similar to the Existing with Project Event analysis, traffic noise impacts from project-generated traffic under Year 2030 conditions would be comparable to traffic noise impacts of events currently permitted at Honda Center. As previously discussed, the generally accepted level at which changes in community noise levels become "barely perceptible" typically occurs at values of greater than 3 dBA, and changes of 5 dBA are readily perceptible. The significance criteria for roadway noise impacts are based on whether the proposed project would result in a substantial increase (3 dB or more) in the ambient noise environment along the roadways when the ambient noise environment exceeds 60 dBA CNEL (daily noise levels). Noise increases on Year 2030 event days compared to existing average attendance events will range from 1.5 to 10.8 dBA. The only noise sensitive land uses where audible noise increases would occur are the residential uses adjacent to the segment of Sunkist Street between Cerritos Boulevard and Ball Road. It shall be noted that the long-range noise increases presented for 2030 conditions will occur over a number of years, unlike the comparisons laboratory environments where human reaction to noise studies are derived from. While overall changes in the noise environment that are considered perceptible (+3 dB), the project itself would cause noise increases of up to 0.2 dBA, well below the 3 dBA threshold for project impacts The Proposed Project would result in noise levels increases along the roadways within the study area of the project below significance levels, and no traffic noise impacts would occur under 2030 conditions.

Table 5.4-7
Year 2030 Traffic Noise Levels

Location	Existing No Event CNEL	Year 2030 Average Attendance Event		Year 2030 with Project (Sellout Event)		Increase in CNEL (dBA)	
		ADT	CNEL[1]	ADT	CNEL[1]	from Existing No Event [2]	Due to Project
Ball Road							
Between Sunkist St and SR-57 SB Ramp	77.2	70,960	78.6	72,090	78.7	1.5	0.1
Between SR-57 SB Ramp and Phoenix Club Dr	75.1	78,310	79.0	79,720	79.1	4.0	0.1
Cerritos Avenue							
Between Sunkist St and Douglass Rd	66.4	28,880	74.7	29,900	74.9	8.5	0.2
Douglass Road							
Between Katella Ave and Cerritos Ave	67.6	32,000	74.2	34,100	74.4	6.8	0.2
Katella Avenue							
Between Lewis Street and State College Blvd	75.4	59,260	77.8	59,680	77.9	2.5	0.1
Between State College Blvd and Howell Ave	75.4	63,940	78.2	64,740	78.2	2.8	0.0
Between Howell Ave and SR-57 SB Ramps	77.3	75,280	78.9	77,660	79.0	1.7	0.1
Between SR-57 SB Ramps and SR-57 NB Ramps	75.5	70,690	78.6	73,020	78.7	3.2	0.1
Between SR-57 NB Ramps and Douglass Rd	75.5	68,570	78.5	72,290	78.7	3.2	0.2
Between Douglass Rd and Struck Ave	74.8	75,510	78.9	77,780	79.0	4.2	0.1
Between Struck Ave and Main St	73.8	65,510	78.3	66,640	78.3	4.5	0.0
Between Main St and Batavia St	74.2	53,950	77.4	54,630	77.5	3.3	0.1
Main Street							
Between Katella Ave and Struck Ave	71.9	35,480	75.6	35,920	75.7	3.8	0.1
Phoenix Club Drive							
Between Honda Center and Ball Rd	63.4	40,850	74.1	42,040	74.2	10.8	0.1
State College Boulevard							
Between Howell Ave and Katella Ave	73.3	48,140	76.9	48,520	77.0	3.7	0.1
Sunkist Street							
Between Cerritos Ave and Ball Rd	68.4	15,400	72.0	16,130	72.2	3.8	0.2

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.
Bold: Audible (+3 dB) changes in the ambient noise environment from traffic noise.
[1] Noise levels are calculated at 50 feet from the roadway centerline.
[2] The "Increase from Existing" is the difference in traffic noise between the existing year without event and Year 2030 with project (sellout event) and represents the overall increase in cumulative noise.
[3] The "Increase Due to Project" is the difference in traffic noise between Year 2030 with average attendance event and Year 2030 with project (sellout event) conditions and represents the change in noise traffic noise levels from event traffic.

Summary

As analyzed above, while general noise increases for Year 2013 and Year 2030 are anticipated for the Honda Center and its vicinity, increases due particularly to the Proposed Project are not expected. The Proposed

Project will not cause substantial traffic noise increases to off-site sensitive receptors during sellout events, and is not expected to generate discernable stationary noise levels beyond those already in existence.

5.4.4 Cumulative Impacts

Cumulative noise impacts occur when multiple sources of noise, though individually not substantial, combine and lead to excessive cumulative noise exposure at noise-sensitive uses.

Traffic Noise modeling was conducted to identify cumulative impacts from concurrent scheduling of events at the Honda Center and the Angel Stadium of Anaheim for year 2013 and year 2030 (General Plan buildout) conditions shown in Table 5.4-8 and Table 5.4-9, respectively. Noise increases on Year 2030 with sellout event plus an Angels Stadium event day compared to existing without events will range from 1.5 to 10.8 dBA. The only noise sensitive land uses where audible noise increases would occur are located along Sunkist Street between Cerritos Avenue and Ball Road. MM 5.4-1 would reduce the anticipated cumulative noise increase of 3.8 dBA to the sensitive receptors along this roadway segment. The estimated 6 dBA noise reduction provided by the pavement would offset the cumulative increase, eliminating the cumulative noise impact. With implementation of MM 5.4-1, cumulative noise impacts to noise sensitive receptors would be avoided.

Table 5.4-8
Cumulative Conditions - Year 2013 Traffic Noise Levels

Location	Existing No Event CNEL	Year 2013 with Average Attendance Event plus Angels Stadium Event		Year 2013 with Project (Sellout Event) plus Angels Stadium Event		Increase in CNEL (dBA)	
		ADT	CNEL[1]	ADT	CNEL[1]	Cumulative [2]	Project[3]
Ball Road							
Between Sunkist St and SR-57 SB Ramp	77.2	57,730	77.7	58,860	77.8	0.6	0.1
Between SR-57 SB Ramp and Phoenix Club Dr	75.1	36,900	75.8	38,310	75.9	0.8	0.1
Cerritos Avenue							
Between Sunkist St and Douglass Rd	66.4	6,210	68.0	7,230	68.7	2.3	0.7
Douglass Road							
Between Katella Ave and Cerritos Ave	67.6	10,820	69.5	12,920	70.2	2.6	0.7
Katella Avenue							
Between Lewis Street and State College Blvd	75.4	38,810	76.0	39,230	76.0	0.6	0.0
Between State College Blvd and Howell Ave	75.4	41,130	76.2	41,930	76.3	0.9	0.1
Between Howell Ave and SR-57 SB Ramps	77.3	60,750	77.9	63,130	78.1	0.8	0.2
Between SR-57 SB Ramps and SR-57 NB Ramps	75.5	43,010	76.4	45,340	76.7	1.2	0.3
Between SR-57 NB Ramps and Douglass Rd	75.5	46,360	76.8	50,080	77.1	1.6	0.3
Between Douglass Rd and Struck Ave	74.8	36,550	75.7	38,820	76.0	1.2	0.3
Between Struck Ave and Main St	73.8	27,160	74.4	28,290	74.6	0.8	0.2
Between Main St and Batavia St	74.2	29,190	74.8	29,870	74.9	0.7	0.1
Main Street							
Between Katella Ave and Struck Ave	71.9	18,530	72.8	18,970	72.9	1.0	0.1
Phoenix Club Drive							
Between Honda Center and Ball Rd	63.4	5,710	65.5	6,900	66.4	**3.0**	0.9
State College Boulevard							
Between Howell Ave and Katella Ave	73.3	23,910	73.9	24,290	74.0	0.7	0.1
Sunkist Street							
Between Cerritos Ave and Ball Rd	68.4	8,550	69.4	9,280	69.8	1.4	0.4

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.

Bold: Audible (+3 dB) changes in the ambient noise environment from traffic noise.

[1] Noise levels are calculated at 50 feet from the roadway centerline.

[2] The "Cumulative" increase is the difference in traffic noise between the existing year without event and Year 2013 with Project (sellout events) at the Honda Center plus the Angels Stadium of Anaheim, and represents the overall increase in cumulative noise.

[3] The "Project" increase is the difference in traffic noise between Year 2013 with Honda Center sellout events plus Angeles Stadium of Anaheim event, and Year 2013 with average attendance Honda Center event plus Angels Stadium of Anaheim event conditions, and represents the project contribution to the overall cumulative noise increase.

Table 5.4-9
Cumulative Conditions - Year 2030 Traffic Noise Levels

Location	Existing No Event CNEL	Year 2030 with Average Attendance Event plus Angels Stadium Event		Year 2030 with Project (Sellout Event) plus Angels Stadium Event		Increase in CNEL (dBA)	
		ADT	CNEL[1]	ADT	ADT	Cumulative[2]	Project[3]
Ball Road							
Between Sunkist St and SR-57 SB Ramp	77.2	70,960	78.6	72,090	78.7	1.5	0.1
Between SR-57 SB Ramp and Phoenix Club Dr	75.1	78,310	79.0	79,720	79.1	**4.0**	0.1
Cerritos Avenue							
Between Sunkist St and Douglass Rd	66.4	28,880	74.7	29,900	74.9	**8.5**	0.2
Douglass Road							
Between Katella Ave and Cerritos Ave	67.6	32,000	74.2	34,100	74.4	**6.8**	0.2
Katella Avenue							
Between Lewis Street and State College Blvd	75.4	60,600	77.9	61,020	78.0	2.6	0.1
Between State College Blvd and Howell Ave	75.4	66,350	78.3	67,150	78.4	**3.0**	0.1
Between Howell Ave and SR-57 SB Ramps	77.3	75,280	78.9	77,660	79.0	1.7	0.1
Between SR-57 SB Ramps and SR-57 NB Ramps	75.5	72,060	78.7	74,390	78.8	**3.3**	0.1
Between SR-57 NB Ramps and Douglass Rd	75.5	71,510	78.6	75,230	78.9	**3.4**	0.3
Between Douglass Rd and Struck Ave	74.8	76,290	78.9	78,560	79.1	**4.3**	0.2
Between Struck Ave and Main St	73.8	65,510	78.3	66,640	78.3	**4.5**	0.0
Between Main St and Batavia St	74.2	53,950	77.4	54,630	77.5	**3.3**	0.1
Main Street							
Between Katella Ave and Struck Ave	71.9	36,870	75.8	37,310	75.8	**3.9**	0.0
Phoenix Club Drive							
Between Honda Center and Ball Rd	63.4	40,990	74.1	42,180	74.2	**10.8**	0.1
State College Boulevard							
Between Howell Ave and Katella Ave	73.3	48,360	76.9	48,740	77.0	**3.7**	0.1
Sunkist Street							
Between Cerritos Ave and Ball Rd	68.4	15,400	72.0	16,130	72.2	**3.8**	0.2

Source: FHWA, Highway Traffic Noise Prediction Model, based on traffic volumes obtained from the traffic analysis prepared by Parsons Brinkerhoff (2012) and speed limits obtained from Google Earth Street View.

Bold: Audible (+3 dB) changes in the ambient noise environment from traffic noise.

[1] Noise levels are calculated at 50 feet from the roadway centerline.

[2] The "Cumulative" increase is the difference in traffic noise between the existing year without event and Year 2030 with project (sellout events) at the Honda Center plus the Angels Stadium of Anaheim and represents the overall increase in cumulative noise.

[3] The "Project" increase is the difference in traffic noise between Year 2030 with Honda Center sellout events plus Angeles Stadium of Anaheim event, and Year 2030 with average attendance Honda Center event plus Angels Stadium of Anaheim event conditions, and represents the project contribution to the overall cumulative noise increase.

5.4.5 Existing Regulations and Standard Conditions

- State of California Interior and Exterior Noise Standards are incorporated into the California Building Code (Title 24, Part 2, California Code of Regulations) and are the noise standards required for new construction in California.
- Community noise standards adopted by the City of Anaheim in the General Plan, Noise Element.
- City of Anaheim Municipal Code, Chapter 6.20, Sound Pressure Levels: Stationary Noise Standards.
- City of Anaheim Municipal Code, Chapter 6.20, Construction Noise
- City of Anaheim Municipal Code, Chapter 18.20.160, Compatibility Standards
- FTA groundborne vibration and noise impact criteria.

5.4.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the Impact 5.4-1 would be less than significant. However, a potentially significant cumulative noise impact (Impact 5.4-2) to residential areas located east of Sunkist Street between Cerritos Avenue and Ball Road could occur with concurrent scheduling of events at the Honda Center and the Angel Stadium of Anaheim for year 2030 when added to future cumulative development.

5.4.7 Mitigation Measures

Impact 5.4-2

4-1 Prior to issuance of building permits, the project applicant shall contribute fair-share funding to repave Sunkist Street between Cerritos Avenue and Ball Road with rubberized asphalt. Studies have shown that asphalt rubber overlays resulted in a reduction in road noise in the order of 6 dB. (Rymer and Donavan, 2005)

5.4.8 Level of Significance After Mitigation

No significant project-related impacts have been identified. With implementation of MM 5.4-1, cumulative noise impacts would be less than significant.

This page intentionally left blank.