5.9 NOISE

This section of the recirculated Draft EIR discusses the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; reviews noise levels at existing receptor locations; evaluates potential noise impacts associated with the IBC Vision Plan and Mixed Use Overlay Zoning Code (proposed project); and provides mitigation to reduce noise impacts at sensitive locations. This evaluation uses procedures and methodologies as specified by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA). Noise calculations on which this analysis is based are included in Appendix L, *Noise Modeling Datasheets.*

5.9.1 Environmental Setting

Terminology/Noise Descriptors

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

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

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

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

- 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 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). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA 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 of noise perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 5.9-1, *Change in Sound Pressure Level, dB*, presents the subjective effect of changes in sound pressure levels.

Table 5.9-1
Change in Sound Pressure Level
(dB)

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 1988.

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.

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 is the level that is exceeded 50 percent of the time. This level is also the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08} and L_{25} values are 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 called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (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 system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the

nervous system. Extended periods of noise exposure above 90 dBA 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 results in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in less developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Table 5.9-2 shows *Typical Noise Levels from Noise Sources*.

Table 5.9-2
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: Caltrans. Traffic Noise Analysis Protocol, Table 9-2136.2. October 1998.

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is 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 project construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure. Analysis of this type of vibration is best measured in velocity and acceleration.

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 in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). The threshold of perception is approximately 65 VdB. Typically; groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Even the more persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Human made vibration problems are, therefore, usually confined to short distances (500 feet or less) from the source.

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at distances within 200 feet of the vibration sources. Heavy trucks can also generate groundborne vibrations, which 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 Irvine

regulates noise through the City of Irvine Municipal Code, Chapter 2, Noise (Sections 6-8-201 through 6-8-209). Potential noise and vibration impacts were evaluated based on the City of Irvine Municipal Code, City of Irvine General Plan, FHWA methodology, and Federal Transit Administration (FTA) methodology to determine whether a significant adverse noise impact would result from the construction and operation of the proposed project.

State of California Building Code

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, 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. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL. Title 21 of the California Code of Regulations prescribes additional requirements for noise-sensitive structures within the 65 dBA CNEL noise contour of an airport.

City of Irvine

Land Use Compatibility Criteria

The noise standards specified in the City of Irvine Noise Element are a guideline to evaluate the acceptability of the noise levels generated by traffic flow. These standards are for assessment of long-term traffic noise impacts on land uses. The City of Irvine uses the state's land use compatibility standards shown in Table 5.9-3 to determine the compatibility of a proposed land use based on the noise environment. Based on these standards, the City has developed policies to ensure land use compatibility when placing new land uses. The City uses 65 dBA CNEL as the critical criterion for assessing the compatibility of residential land uses with noise sources. The City requires that the exterior areas for new residential land uses not exceed 65 dBA CNEL. In addition, the City requires that commercial developments achieve an indoor noise standard of 55 dBA CNEL and the residential 45 dBA CNEL with windows closed, which is based on the California Building Code and Noise Insulation standards.

Table 5.9-3
State of California Land Use Compatibility for Exterior Community Noise

Land Use Category	Noise Range (L_{dn} or CNEL), dB			
	I	II	III	IV
Passively used open spaces	50	50–55	55–70	70+
Auditoriums, concert halls, amphitheaters	45–50	50–65	65–70	70+
Residential: low-density single-family, duplex, mobile homes	50–55	55–70	70–75	75+
Residential: multifamily	50–60	60–70	70–75	75+
Transient lodging: motels, hotels	50–60	60–70	70–80	80+
Schools, libraries, churches, hospitals, nursing homes	50–60	60–70	70–80	80+
Actively used open spaces: playgrounds, neighborhood parks	50–67	–	67–73	73+
Golf courses, riding stables, water recreation, cemeteries	50–70	–	70–80	80+
Office buildings, business commercial and professional	50–67	67–75	75+	–
Industrial, manufacturing, utilities, agriculture	50–70	70–75	75+	–

Source: Office of Noise Control, California Department of Health, 1976. LSA Associates, Inc., December 2007.
Noise Range I—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.
Noise Range II—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 are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Noise Range III—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 and needed noise insulation features included in the design.
Noise Range IV—Clearly Unacceptable: New construction or development should generally not be undertaken.

City of Irvine Nontransportation/Stationary-Source Noise Standards

The City's Noise Ordinance establishes the maximum permissible noise level that may intrude into a neighbor's property. The Noise Ordinance (adopted in 1975 and revised in February 2005) establishes noise level standards for various land use categories affected by stationary noise sources. For residential properties, the exterior noise level shall not exceed 55 dBA during daytime hours (7:00 AM to 10:00 PM) and shall not exceed 50 dBA during the nighttime hours (10:00 PM to 7:00 AM) for more than 30 minutes in any hour. For events occurring within shorter periods of time, these noise levels are adjusted upwards accordingly, as shown in Table 5.9-4.

Table 5.9-4
City of Irvine Exterior Noise Standards
(L_{eq})

Noise Zone	Time Interval	L_{50}	L_{25}	L_8	L_2	L_{max}
Zone 1: hospitals, libraries, churches, schools, and residential properties	7:00 AM to 10:00 PM	55	60	65	70	75
	10:00 PM to 7:00 AM	50	55	60	65	70
Zone 2: professional office and public institutional	Anytime	55	60	65	70	75
Zone 3: commercial, excluding professional office	Anytime	60	65	70	75	80
Zone 4: industrial	Anytime	70	75	80	85	90

Source: City of Irvine, Municipal Code, Chapter 2, Noise.
Noise standards shall be reduced by five dB for impact, or predominant tone noise or for noises consisting of speech or music. In the event that the noise source and the affected property are within different noise zones, the noise standards of the affected property shall apply.

Maintenance of property may exceed the noise standards, so long as maintenance activities that exceed the noise limits in Table 5.9-4 are restricted to the hours of 7:00 AM through 7:00 PM Monday through Friday or 9:00 AM through 6:00 PM Saturdays. In addition, the City further restricts the maximum noise levels of leaf blowers and hours of use to 8:00 AM through 5:00 PM Monday through Friday and 9:00 AM through 5:00 PM on Saturdays.

Commercial Deliveries/Pickups

Commercial deliveries or pickups for commercial properties that share a property line with any residential property are required to limit the hours of delivery/pickup service to 7:00 AM through 10:00 PM daily.

Aircraft Noise Compatibility Standards

As a vehicle approaches, passes by, and then recedes into the distance, the sound level rises, reaches a maximum, and then fades into the background noise. The sound level reached during this pass-by event is called single-event noise. Single-event noise is important for relating the maximum amount of noise that would result in nighttime awakenings and/or classroom speech interruptions.

The City requires, as part of the Noise Element, that any sensitive land uses in the 60 dBA CNEL contour for aircraft noise sources also comply with the City's single-event noise standard. The single-event noise standard is above and beyond what other jurisdictions and agencies have adopted and is a supplemental noise criteria. In other words, the City's single-event noise threshold is in addition to the Title 21 and Title 24 interior noise standards of 45 dBA CNEL. No other jurisdiction or agency has an L_{max} standard. This standard is in terms of the $L_{max}(10)$ noise level, which is the loudest 10 percent of aircraft noise events. The City requires the indoor $L_{max}(10)$ noise level for residences to be less than 65 dBA during daytime hours (7:00 AM to 7:00 PM) and less than 55 dBA during evening and nighttime hours (7:00 PM to 7:00 AM). Since the loudest noise associated with aircraft is essentially the same during the day or evening, homes must be constructed to comply with the more stringent 55 dBA criteria. The $L_{max}(10)$ levels cannot be forecast using computer models or other analytical tools and must be measured for a given time.

Construction Noise Hours

The Noise Ordinance regulates the timing of construction activities and includes special provisions for sensitive land uses. Construction activities shall occur only between the hours of 7:00 AM and 7:00 PM Monday through Friday and 9:00 AM to 6:00 PM Saturdays (Section 6-8-205). No construction shall be permitted outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the Chief Building Official or authorized representative. Trucks, vehicles, and equipment that are making or involved with deliveries, loading, or transfer of materials, equipment service, or maintenance of any devices or appurtenances for or within any construction project in the City are also subject to these prohibitions.

Federal Transit Administration Vibration Criteria

Vibration Annoyance

Groundborne noise is the vibration of floors and walls that may cause rattling of items such as windows or dishes on shelves, or a rumbling noise. The rumbling is created by the motion of the room surfaces, which act like a giant loudspeaker. The FTA provides criteria for acceptable levels of groundborne vibration based on the relative perception of a vibration event for various vibration-sensitive land uses (see Table 5.9-5).

Table 5.9-5
Groundborne Vibration and Noise Impact Criteria, Human Annoyance

Land Use Category	Max L_v (VdB)[1]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and nonsensitive areas.
Office	84	Felt vibration. Appropriate to offices and nonsensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms.

Source: FTA 2006.
[1] As measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.

Vibration-Related Structural Damage

The level at which groundborne vibration is strong enough to cause structural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards, shown in Table 5.9-6.

Table 5.9-6
Groundborne Vibration and Noise Impact Criteria, Structural Damage

Building Category	PPV (in/sec)	VdB
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

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

Vibration-related problems generally occur due to resonances in the structural components of a building because structures amplify groundborne vibration. Resonant response is frequency-dependent, and one-third octave band charts are best for describing vibration behavior. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. According to the Caltrans Transportation Related Earthborne Vibration (2002), extreme care must be taken when sustained pile driving occurs within 25 feet of any building; the threshold at which there is a risk of architectural damage to normal houses with plastered walls and ceilings is 0.2 inch per second.

Existing Noise Environment

The IBC is impacted by a multitude of noise sources. Mobile sources of noise, especially cars and trucks on the local roadway network, are the most common and significant in the IBC. Major thoroughfares in the IBC area are Red Hill Avenue, Von Karman Avenue, Jamboree Road, Campus Drive, DuPont Drive, Michelson Drive, Interstate 405 (I-405), Main Street, MacArthur Boulevard, McGaw Avenue, Alton Parkway, and Barranca Parkway. In addition, airport noise from the John Wayne Airport contributes significantly to the ambient noise environment. Secondary noise includes stationary-source noise generated by land uses in the City.

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 dBA. Major arterials accommodate very large volumes of traffic and are responsible for a significant contribution to the noise environment in the IBC. Smaller local and collector streets also contribute to the ambient noise environment, but to a much lesser extent. 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. Noise modeling was conducted using the FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) based on average daily traffic (ADT) volumes provided by Parson Brinkerhoff (December 2009). Table 5.9-7 lists noise levels on roadways in the vicinity of the project site at 50 feet from the roadway centerline. Existing noise levels are based on traffic volumes generated by existing conditions and do not include trips from units under construction or approved projects.

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	*ADT Volume*	*CNEL (dBA @ 50 ft)*	*Distance to CNEL Contour (Feet from Centerline)*		
			60 (dBA CNEL)	*65 (dBA CNEL)*	*70 (dBA CNEL)*
Anton Boulevard					
Bristol Street to Sunflower Avenue	7,620	67.9	169	78	36
Baker Street					
Bear Street to Bristol Street	23,497	73.9	422	196	91
Bristol Street to SR-55 SB Ramps	27,498	74.6	469	218	101
SR-55 SB to SR-55 NB	24,275	74.0	431	200	93
SR-55 NB to Red Hill Avenue	13,718	71.6	295	137	64
Red Hill Avenue to Airway Avenue	4,699	66.9	144	67	31
Bear Street					
Paularino Avenue to Baker Street	17,577	72.6	348	161	75
Bristol Street					
Segerstrom Avenue to West Alton Avenue	35,789	75.7	559	259	120
West Alton Avenue to MacArthur Boulevard	38,850	76.1	590	274	127
MacArthur Boulevard to Sunflower Avenue	22,305	73.7	408	189	88
Sunflower Avenue to Anton Boulevard	42,108	76.4	623	289	134
Anton Boulevard to I-405 NB Ramps	62,602	78.2	811	377	175
I-405 NB Ramps to I-405 SB Ramps	63,048	78.2	815	378	176
I-405 SB Ramp to Paularino Avenue	40,727	76.3	609	283	131
Paularino Avenue to Baker Street	34,095	75.5	541	251	117
Baker Street to SR-55	24,713	74.1	437	203	94
SR-55 to Red Hill Avenue	20,914	73.4	391	181	84
Del Mar Avenue					
Newport Boulevard SB to Newport Boulevard NB	12,232	71.1	273	127	59
Newport Boulevard to Santa Ana Avenue	7,069	68.7	190	88	41

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Flower Street					
Segerstrom Avenue to MacArthur Boulevard	9,756	70.1	235	109	51
MacArthur Boulevard to Sunflower Avenue	8,180	69.3	209	97	45
Sunflower Avenue to Anton Boulevard	6,193	68.1	174	81	37
Main Street					
Sunflower Avenue to SR-55	20,195	73.2	382	177	82
Mesa Drive					
Newport Boulevard SB to Newport Boulevard NB	5,469	67.6	160	74	34
Newport Boulevard NB to Santa Ana Avenue	5,674	67.7	164	76	35
Irvine Avenue to Birch Street	8,487	69.5	214	99	46
Paularino Avenue					
Bear Street to Bristol Street	7,632	66.8	141	66	30
Bristol Street to SR-55 SB	16,284	70.1	234	109	50
SR-55 SB to SR-55 NB	15,141	69.7	223	103	48
SR-55 NB to Red Hill Avenue	3,967	63.9	91	42	20
Red Hill Avenue to Airway Avenue	10,781	68.3	178	83	38
Red Hill Avenue					
Main Street to Paularino Avenue	16,060	72.2	328	152	71
Paularino Avenue to Baker Street	15,961	72.2	326	151	70
Baker Street to Bristol Street	14,182	71.7	301	140	65
Santa Ana Avenue					
Mesa Drive to Bristol Street	9,020	67.5	158	73	34
University Drive					
Santa Ana Avenue to Irvine Avenue	5,684	68.7	191	89	41
Alton Parkway					
Daimler Street to Red Hill Avenue	4,578	67.8	166	77	36
Red Hill Avenue to Von Karman Avenue	12,332	72.1	321	149	69
Von Karman Avenue to Jamboree Road	14,649	72.9	360	167	77
Jamboree Road to Murphy Avenue	15,133	73.0	367	171	79
Murphy Avenue to Harvard Avenue	15,645	73.1	376	174	81
Harvard Avenue to Paseo Westpark	15,465	73.1	373	173	80
Paseo Westpark to San Marino	12,620	72.2	326	151	70
San Marino to Culver Drive	21,617	74.5	466	216	100
Barranca Parkway (Dyer)					
Pullman to Red Hill Avenue	24,454	75.1	506	235	109
Red Hill Avenue to Armstrong	30,266	76.0	583	271	126
Armstrong to Von Karman Avenue	29,815	75.9	577	268	124
Von Karman Avenue to Jamboree Road	22,039	74.6	472	219	102
Jamboree Road to Construction Circle	24,517	75.1	507	235	109
Construction Circle to Harvard Avenue	21,003	74.4	457	212	98
Harvard Avenue to Paseo Westpark	19,905	74.2	441	205	95
Paseo Westpark to Santa Rosa	21,004	74.4	457	212	98
Santa Rosa to Culver Drive	21,643	74.5	466	216	100

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Bryan Avenue					
Jamboree Road to Marketplace	21,001	74.4	457	212	98
Marketplace to El Camino Real	17,921	73.7	411	191	89
El Camino Real to Rubicon	14,726	72.9	361	167	78
Rubicon to Culver Drive	18,343	73.8	418	194	90
Campus Drive					
MacArthur Boulevard to Martin	16,279	71.2	280	130	60
Martin to Von Karman Avenue	12,892	70.2	240	111	52
Von Karman Avenue to Teller Avenue	11,823	69.8	226	105	49
Teller Avenue to Jamboree Road	10,315	69.2	207	96	44
Jamboree Road to Carlson Avenue	20,089	75.2	513	238	110
Carlson Avenue to University Drive	18,247	74.7	481	223	104
Carlson Avenue					
Michelson Drive to Campus Drive	3,901	68.0	172	80	37
Culver Drive					
I-5 NB Ramps to I-5 SB Ramps	36,738	76.8	664	308	143
I-5 SB Off-Ramp to Scottsdale Drive	49,687	78.2	812	377	175
Scottsdale Drive to Walnut Avenue	44,077	77.6	749	348	161
Walnut Avenue to Deerfield Avenue	42,201	77.4	728	338	157
Deerfield Avenue to Irvine Center Drive	38,904	77.1	690	320	149
Irvine Center Drive to Warner Avenue	41,580	77.4	721	335	155
Warner Avenue to Barranca Parkway	40,870	77.3	713	331	154
Barranca Parkway to Alton Parkway	44,253	77.7	751	349	162
Alton Parkway to Main Street	45,204	77.7	762	354	164
Main Street to San Leandro	49,711	78.2	812	377	175
San Leandro to I-405 NB On-Ramp	54,428	78.6	863	400	186
I-405 SB On-Ramp to Michelson Drive	53,319	78.5	851	395	183
Michelson Drive to Sandburg Way	39,658	77.2	698	324	150
Sandburg Way to University Drive	32,408	76.3	610	283	132
El Camino Real					
Jamboree Road to Alliance	20,876	73.4	390	181	84
Fairchild Road					
MacArthur Boulevard to Jamboree Road	4,393	67.6	161	75	35
Harvard Avenue					
Walnut Avenue to Poplar Street	9,179	70.8	263	122	57
Poplar Street to Deerfield Avenue	11,387	71.8	304	141	65
Deerfield Avenue to Irvine Center Drive	10,273	71.3	284	132	61
Irvine Center Drive to Paseo Westpark	12,508	72.2	324	150	70
Paseo Westpark to Warner Avenue	11,065	71.6	298	138	64
Warner Avenue to Barranca Parkway	12,686	72.2	327	152	70
Barranca Parkway to San Juan	15,295	73.0	370	172	80
San Juan to San Leon	14,888	72.9	363	169	78
San Leon to Alton Parkway	16,362	73.3	387	180	83
Alton Parkway to San Marino	18,655	73.9	422	196	91
San Marino to Main Street	19,291	74.0	432	201	93

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Main Street to Coronado	13,552	72.5	341	158	74
Coronado to Michelson Drive	20,167	74.2	445	207	96
Michelson Drive to University Drive	8,672	70.6	253	118	55
Irvine Center Drive					
Harvard Avenue to Hearthstone	17,848	73.7	410	190	88
Hearthstone to Culver Drive	15,815	73.2	378	176	82
Jamboree Road					
Bryan Avenue to El Camino Real	39,163	77.1	693	321	149
El Camino Real to I-5 NB On-Ramp	61,511	79.1	936	434	202
I-5 NB Ramps to I-5 SB Off-Ramp	65,707	79.4	978	454	211
I-5 SB Off-Ramp to Michelle Drive	57,976	78.8	900	418	194
Michelle Drive to Walnut Avenue	54,497	78.6	863	401	186
Walnut Ave to Edinger Ave (& Frontage Rds.)	71,936	79.8	1039	482	224
Edinger Avenue to Warner Avenue	78,493	80.1	1101	511	237
Warner Avenue to Barranca Parkway	69,451	79.6	1015	471	219
Barranca Parkway to Beckman Avenue	50,727	78.2	823	382	177
Beckman Avenue to Alton Parkway	49,220	78.1	807	374	174
Alton Parkway to McGaw Avenue	46,536	77.9	777	361	167
McGaw Avenue to Kelvin Avenue	45,004	77.7	760	353	164
Kelvin Avenue to Main Street	53,259	78.5	850	395	183
Main Street to I-405 Off-Ramp	52,524	78.4	842	391	181
I-405 On-Ramp to Michelson Drive	69,470	79.6	1015	471	219
Michelson Drive to Dupont Drive	51,529	78.3	832	386	179
Dupont Drive to Campus Drive	45,645	77.8	767	356	165
Campus Drive to Birch Street	40,300	77.2	706	328	152
Birch Street to Fairchild Road	32,438	76.3	611	284	132
Fairchild Road to Koll Center	33,237	76.4	621	288	134
Koll Center to MacArthur Boulevard	26,722	75.5	537	249	116
MacArthur Boulevard					
Fitch to Red Hill Avenue	35,926	76.7	654	303	141
Red Hill Avenue to Skypark Boulevard	15,788	73.2	378	175	81
Skypark Boulevard to Main Street	25,505	75.3	520	242	112
Main Street to I-405 NB Off-Ramp	33,677	76.5	626	291	135
I-405 SB On-Ramp to Michelson Drive	48,662	78.1	800	372	172
Michelson Drive to Douglass	40,604	77.3	709	329	153
Douglass to Campus Drive	33,358	76.4	622	289	134
Jamboree Road to Fairchild Road	30,151	76.0	582	270	125
Fairchild Road to University Drive	34,000	76.5	630	293	136
Main Street					
McDurmott to Red Hill Avenue	18,121	73.8	414	192	89
Red Hill Avenue to Executive Park	16,818	73.5	394	183	85
Executive Park to MacArthur Boulevard	26,160	75.4	529	246	114
MacArthur Boulevard to Mercantile	35,615	76.7	650	302	140
Gillette Avenue to Von Karman Avenue	17,820	73.7	410	190	88
Von Karman Avenue to Cartwright	16,082	73.3	383	178	82

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Siglo to Jamboree Road	22,024	74.6	472	219	102
Jamboree Road to Union	19,037	74.0	428	199	92
Veneto to Harvard Avenue	10,456	71.4	287	133	62
Harvard Avenue to San Mateo	11,382	71.8	304	141	65
Paseo Westpark to Culver Drive	8,757	70.6	255	118	55
McGaw Avenue					
Daimler Street to Red Hill Avenue	3,630	66.8	142	66	31
Red Hill Avenue to Von Karman Avenue	5,653	68.7	191	88	41
Von Karman Avenue to Jamboree Road	6,451	69.3	208	97	45
Jamboree Road to Murphy Avenue	2,462	65.1	109	51	24
Michelson Drive					
MacArthur Boulevard to Dupont Drive	14,917	71.9	312	145	67
Bixby to Von Karman Avenue	10,836	70.5	252	117	54
Von Karman Avenue to Obsidian	10,559	70.4	248	115	53
Teller Avenue to Jamboree Road	17,973	72.7	353	164	76
Jamboree Road to Carlson Avenue	14,864	71.9	311	144	67
Carlson Avenue to Prince	16,704	72.4	336	156	72
Riparian View to Harvard Avenue	16,553	72.4	334	155	72
Harvard Avenue to Parkside Drive	11,741	70.9	266	123	57
Parkside Drive to Culver Drive	16,629	72.4	335	156	72
Red Hill Avenue					
Dyer/Barranca Parkway to Deere Avenue	26,611	75.4	535	248	115
Deere Avenue to Alton Parkway	26,630	75.4	536	249	115
Alton Parkway to McGaw Avenue	26,216	75.4	530	246	114
McGaw Avenue to MacArthur Boulevard	34,187	76.5	633	294	136
MacArthur Boulevard to Skypark	9,780	71.1	275	127	59
Skypark to Main Street	12,554	72.2	324	151	70
University Drive					
MacArthur Boulevard to California Avenue	23,581	75.9	571	265	123
California Avenue to Mesa Road	32,837	77.3	712	330	153
Mesa Road to Campus Drive	33,673	75.5	537	249	116
Campus Drive to Harvard Avenue	26,248	74.4	454	211	98
Harvard Avenue to San Joaquin Hills Road	21,301	75.4	533	247	115
San Joaquin Hills Road to Culver Drive	21,676	75.5	539	250	116
Von Karman Avenue					
Barranca Parkway to Alton Parkway	16,770	72.4	337	156	73
Alton Parkway to McGaw Avenue	16,349	72.3	331	154	71
McGaw Avenue to Anchor	17,271	72.6	344	160	74
Anchor to Main Street	17,763	72.7	350	163	75
Main Street to Morse Avenue	18,765	72.9	363	169	78
Quartz to Michelson Drive	20,193	73.2	382	177	82
Michelson Drive to Dupont Drive	16,840	72.5	338	157	73
Dupont Drive to Martin	16,346	72.3	331	154	71
Martin to Campus Drive	14,234	71.7	302	140	65

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Walnut Avenue					
Myford to Jamboree SB Off-Ramp	21,169	73.4	394	183	85
Jamboree Road to Peters Canyon	18,580	72.9	361	168	78
Peters Canyon to Harvard Avenue	18,125	72.8	355	165	76
Harvard Avenue to Mall Street	16,040	72.2	327	152	71
Mall Street to Culver Drive	20,951	73.4	391	182	84
Warner Avenue					
Construction North to Harvard Avenue	8,225	69.3	210	97	45
Harvard Avenue to Paseo Westpark	5,766	67.8	165	77	36
Santa Ynez to Culver Drive	6,493	68.3	179	83	39
Birch Street					
Mesa Drive to Bristol Street SB	10,372	69.3	207	96	45
Bristol Street SB to Bristol Street NB	15,579	71.0	272	126	59
East of MacArthur Boulevard	20,327	72.2	325	151	70
West of MacArthur Boulevard	11,707	69.8	225	104	48
East of Von Karman Avenue	20,327	72.2	325	151	70
Bison Avenue					
Jamboree Road to MacArthur Boulevard	9,087	69.8	224	104	48
MacArthur Boulevard to SR-73	13,411	71.5	290	135	63
Bristol					
Red Hill Avenue to Campus Drive	20,119	73.2	381	177	82
Campus Drive to Birch Street	33,382	75.4	533	248	115
West of Jamboree Road	42,491	76.5	627	291	135
Campus Drive					
Bristol Street NB to MacArthur Boulevard	27,671	75.6	549	255	118
Ford Road					
Jamboree Road to MacArthur Boulevard	9,051	70.8	261	121	56
Irvine Avenue					
Bristol Street NB to Bristol Street SB	22,879	73.8	415	192	89
Bristol Street SB to Mesa Drive	24,237	74.0	431	200	93
South of University Drive	22,253	73.7	407	189	88
Jamboree Road					
South of MacArthur Boulevard	28,826	75.8	565	262	122
Bristol Street SB to Bristol Street NB	46,597	77.9	778	361	168
South of Bristol Street	48,897	78.1	803	373	173
University Drive to Bison Avenue	42,624	77.5	733	340	158
Bison Avenue to Ford Road	33,614	76.5	626	290	135
MacArthur Boulevard					
Campus Drive to Birch Street	21,187	74.5	460	213	99
South of Birch Street	23,445	74.9	492	228	106
Von Karman Avenue to Jamboree Road	23,568	74.9	494	229	106
University Drive to Bison Avenue	43,429	77.6	742	344	160
Bison Avenue to Ford Road	75,856	80.0	1076	500	232

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
University Drive					
East of Irvine Avenue	823	60.3	53	24	11
Jamboree Road to MacArthur Boulevard	14,628	72.8	359	167	77
Von Karman Avenue					
South of Campus Drive	10,305	71.3	284	132	61
South of Birch Street	11,237	71.7	301	140	65
Dyer Road					
Main Street to Halladay Street	25,688	75.3	523	243	113
Halladay Street to SR-55 SB	30,243	76.0	583	271	126
SR-55 SB to SR-55 NB	43,265	77.6	740	344	159
SR-55 NB to Pullman Street	29,458	75.9	573	266	123
Grand Avenue					
Warner Avenue to Hotel Terrace Drive	22,946	74.8	485	225	104
Hotel Terrace Drive to SR-55 NB	21,501	74.5	464	216	100
Halladay Street					
Dyer Road to Alton Avenue	4,687	64.6	102	47	22
Alton Avenue to McGaw Avenue (Columbine)	1,748	60.4	53	25	11
MacArthur Boulevard					
Flower Street to Main Street	31,093	76.1	594	276	128
Main Street to SR-55 SB	47,010	77.9	782	363	169
Main Street					
Segerstrom Avenue to Alton Avenue	20,603	74.3	451	209	97
Alton Avenue to McGaw Avenue(Columbine)	23,743	74.9	496	230	107
McGaw(Columbine) to MacArthur Boulevard	28,675	75.8	563	261	121
MacArthur Boulevard to Sunflower Avenue	30,103	76.0	581	270	125
McGaw Avenue (Alton)					
Main Street to Halladay Street	3,092	66.1	127	59	27
Segerstrom Avenue					
Bristol Street to Flower Street	11,560	70.8	263	122	57
Flower Street to Main Street	18,676	72.9	362	168	78
Warner Avenue					
Grand Avenue to SR-55	18,190	73.8	415	193	89
Sunflower Avenue					
Bristol Street to Flower Street	40,204	76.2	604	280	130
Flower Street to Anton Boulevard	18,032	72.7	354	164	76
Anton Boulevard to Main Street	19,454	73.1	372	173	80
Browning Avenue					
Walnut Avenue to I-5	4,501	65.6	119	55	26

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Bryan Avenue					
Newport Boulevard to Red Hill Avenue	15,300	73.0	370	172	80
Red Hill Avenue to Browning Avenue	16,200	73.3	385	178	83
Browning Avenue to Tustin Ranch Road	16,700	73.4	392	182	85
Tustin Ranch Road to Jamboree Road	16,800	73.4	394	183	85
Edinger Avenue					
West of Newport Avenue	34,312	77.5	733	340	158
Newport Avenue to Red Hill Avenue	20,215	75.2	515	239	111
Red Hill Avenue and Tustin Ranch Road	22,340	76.5	630	293	136
El Camino Real					
Newport Avenue to Red Hill Avenue	13,735	71.6	295	137	64
Red Hill Avenue to Browning Avenue	8,973	69.7	222	103	48
Browning Avenue to Tustin Ranch Road	8,392	69.4	212	99	46
Tustin Ranch Road to Jamboree Road	13,574	71.5	293	136	63
Irvine Center Drive					
Red Hill Avenue to Jamboree Road	22,340	75.6	550	255	119
Jamboree Road to Harvard Avenue	13,952	73.6	402	187	87
Mitchell Avenue					
Newport Avenue to Red Hill Avenue	7,350	66.6	138	64	30
Red Hill Avenue to Browning Avenue	4,417	64.4	98	46	21
Newport Avenue					
El Camino Real to I-5	28,516	72.5	340	158	73
I-5 to Mitchell Avenue	31,417	72.9	363	168	78
Mitchell Avenue to McFadden Avenue	29,223	72.6	346	160	74
North of Sycamore Avenue	9,604	67.8	165	76	35
Valencia Avenue to Edinger Avenue	18,205	70.5	252	117	54
Nisson Road					
Newport Avenue to Red Hill Avenue	5,593	65.4	115	53	25
Red Hill Avenue to Browning Avenue	3,915	63.9	90	42	19
Red Hill Avenue					
I-5 NB Ramps to El Camino Real	43,222	74.3	449	208	97
I-5 SB Ramps to I-5 NB Ramps	38,996	73.8	419	194	90
Nisson Road to I-5 SB	38,235	73.8	413	192	89
Nisson Road to Mitchell Avenue	26,681	72.2	325	151	70
Mitchell Avenue to Walnut Avenue	25,830	72.1	318	148	69
Walnut Avenue to Sycamore Avenue	27,502	73.5	397	184	86
Sycamore Avenue to Edinger Avenue	29,957	73.9	420	195	91
Edinger Avenue to Valencia Avenue	25,507	73.2	378	175	81
Valencia Avenue to Warner Avenue	26,723	75.5	537	249	116
Warner Avenue to Barranca Parkway/Dyer	29,570	75.9	574	267	124
Sycamore Avenue					
SR-55 NB to Newport Avenue	9,036	67.5	158	73	34
Newport Avenue to Red Hill Avenue	7,758	66.8	143	66	31

Table 5.9-7
Existing Traffic Noise Levels, 2008
(dBA CNEL)

Segment	ADT Volume	CNEL (dBA @ 50 ft)	Distance to CNEL Contour (Feet from Centerline)		
			60 (dBA CNEL)	65 (dBA CNEL)	70 (dBA CNEL)
Tustin Ranch Road					
North of I-5	32,560	76.3	612	284	132
I-5 to Walnut Avenue	21,087	74.4	458	213	99
Valencia Avenue					
Newport Avenue to Red Hill Avenue	3,690	65.9	123	57	26
Walnut Avenue					
East of Newport Avenue	15,375	72.1	318	148	69
East of Red Hill Avenue	15,579	72.1	321	149	69
West of Tustin Ranch Road	19,862	73.2	377	175	81
Franklin Avenue to Myford Road	18,249	72.8	357	166	77
Warner Avenue					
SR-55 to Red Hill Avenue	13,682	72.6	344	159	74

Source: FHWA Traffic Noise Prediction Model. Based on traffic volumes obtained from the traffic analysis prepared by Parson Brinkerhoff (December 2009) and speed limits obtained from Google Maps.
NB: northbound; SB: southbound; EB: eastbound; WB: westbound

Aircraft Noise

Noise from aircraft at the John Wayne Airport (JWA) is produced from takeoffs, flyovers/overflights, approaches, and landings. Each of these events results in noise exposure to sensitive receptors near the airport. The California Public Resources Code, Section 21096, requires that when preparing an Environmental Impact Report for any project within an airport influence area, as defined by an Airport Land Use Compatibility Plan, the lead agency shall utilize the *California Airport Land Use Planning Handbook* as a technical resource with respect to airport noise and safety compatibility issues. The basis for compatibility zone delineation for airports is the CNEL contours created with the Federal Aviation Administration Integrated Noise Model for private and public airports. Figure 5.9-1, *2008 John Wayne Airport Noise Contours*, shows the annual average noise contours for 2008 at the John Wayne Airport. It should be noted that these contours represent existing noise levels at the airport and not projected airport noise levels on which airport noise restrictions are based.

Stationary Sources of Noise

Stationary sources of noise include commercial and industrial equipment and activities. Whereas mobile source noise affects many receptors along an entire length of roadway, stationary noise sources affect their immediate areas. Major stationary sources in the IBC are industrial and warehousing operations. Onsite mechanical equipment and warehousing and industrial truck traffic result in noise on local roadways and in the vicinity of industrial operations.

5.9.2 Thresholds of Significance

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

N-1 Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

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

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

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

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

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

Both Initial Studies, included as Appendices A and B, substantiate that impacts associated with the following thresholds would be less than significant:

- Threshold N-6

This impact will not be addressed in the following analysis.

City of Irvine Thresholds

Noise Compatibility

The noise standards specified in the City of Irvine Noise Element are used to evaluate the acceptability of the noise levels. Based on the noise compatibility criteria, the City has developed policies to ensure land use compatibility when placing new land uses. The City requires that the exterior areas for new residential land uses not exceed 65 dBA CNEL. The City also requires that commercial developments achieve an indoor noise standard of 55 dBA CNEL and residential 45 dBA CNEL with windows closed, which is based on the California Building Code and Noise Insulation standards.

In accordance with Title 21 of the California Code of Regulations, City of Irvine requires new residential developments in the 65 dBA CNEL environs of the John Wayne Airport to mitigate to achieve an interior noise environment of 45 dBA CNEL. In addition, the City requires a supplemental noise criteria for noise-sensitive land uses within the 60 dBA CNEL contour of the John Wayne Airport to be constructed to achieve indoor noise levels below 55 dBA L_{max}(10). The City's single-event supplemental noise criteria is in addition to the mandated state 24-hour interior noise standard of Title 21 and Title 24 of the California Building Code.

Stationary-Source Noise

The City's Noise Ordinance establishes the maximum permissible noise level that may intrude into a neighbor's property. See Table 5.9-4.

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Substantial Increase in Traffic Noise Levels

The traffic noise thresholds used by the City are based on human tolerance to noise 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 noise level, it has the potential to be objectionable or annoying (Caltrans 1998). Consequently, the noise threshold for increase in traffic noise levels is based on the potential for traffic noise to become considerably louder than the ambient noise level. In general, noise levels must increase by 10 dBA in order to double ambient noise levels. An increase of 5 dBA is readily perceptible to the public and a 3 dBA increase is barely perceivable to the average healthy human ear (Caltrans 1998). Based on the City of Irvine noise compatibility criteria of 65 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 with the project exceeds 65 dBA CNEL. For cumulative impacts, the City considers segments where the project contributes any increase in noise levels (0.1 dBA or more) to be substantial when cumulative increase in ambient noise levels are 3 dBA or more.

Construction

The Noise Ordinance regulates the timing of construction activities and includes special provisions for sensitive land uses. No construction shall be permitted outside of the hours specified under Section 6-8-205 of the City of Irvine Municipal Code (7:00 AM to 7:00 PM Monday through Friday and 9:00 AM to 6:00 PM Saturdays) unless a temporary waiver is granted by the Chief Building Official or authorized representative. 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.

Vibration

Based on the FTA vibration criteria, vibration annoyance impacts are considered significant when average vibration levels produced by construction equipment would produce perceptible levels of vibration (78 VdB) during the daytime at offsite vibration-sensitive structures. In addition, vibration that is strong enough to cause structural damage based on the FTA criteria (0.2 in/sec for typical wood-framed buildings or 0.5 in/sec at reinforced concrete, steel, or timber) would be considered significant.

5.9.3 Environmental Impacts

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies (PPP) that apply to the proposed project and will help to reduce and avoid potential impacts related to noise:

PPP 9-1 **Control of Construction Hours:** Construction activities occurring as part of the project shall be subject to the limitations and requirements of Section 6-8-205(a) of the Irvine Municipal Code which states that construction activities may occur between 7:00 AM and 7:00 PM Mondays through Fridays, and 9:00 AM and 6:00 PM on Saturdays. No construction activities shall be permitted outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the Chief Building Official or his or her authorized representative. Trucks, vehicles, and equipment that are making, or are involved with, material deliveries, loading, or transfer of materials, equipment service, maintenance of any devices or appurtenances for or within any construction project in the City shall not be

operated or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the City. Any waiver granted shall take impact upon the community into consideration. No construction activity will be permitted outside of these hours except in emergencies including maintenance work on the City rights-of-way that might be required.

PPP 9-2 **Acoustical Report:** Prior to the issuance of building permits for each structure or tenant improvement other than a parking structure, the applicant shall submit a final acoustical report prepared to the satisfaction of the Director of Community Development. 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. The final acoustical report shall include all information required by the City's Acoustical Report Information Sheet (Form 42-48). In order to demonstrate that all mitigation measures have been incorporated into the project, the report shall be accompanied by a list identifying the sheet(s) of the building plans that include the approved mitigation measures (Standard Condition B.1).

Project Design Features

Many aspects of the project's proposed land use and design serve to directly and indirectly reduce the noise impacts of the project. Such Project Design Features (PDFs) are summarized below and their relevance to reduced impacts is described more fully in the impacts analysis that follows.

Construction

PDF 9-1 As described in the proposed zoning for the project, applicants for individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers, occurring near sensitive receptors shall submit a noise vibration analysis prior to their application being deemed complete by the City. If construction-related vibration is determined to exceed the Federal Transit Administration vibration-annoyance criteria of 78 VdB during the daytime, additional requirements, such as use of less vibration intensive equipment or construction techniques shall be implemented during construction (e.g., drilled piles to eliminate use of vibration-intensive pile driver).

PDF 9-2 Prior to issuance of grading permits, the project applicant shall incorporate the following measures as a note on the grading plan cover sheet to ensure that the greatest distance between noise sources and sensitive receptors during construction activities has been achieved.

- Construction equipment, fixed or mobile, shall be equipped with properly operating and maintained noise mufflers consistent with manufacturer's standards.
- Construction staging areas shall be located away from off-site sensitive uses during the later phases of project development.
- The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site, whenever feasible.

- Construction of sound walls that have been incorporated into the project design prior to construction of the building foundation; or installation of temporary sound blankets (fences typically composed of poly-vinyl-chloride-coated outer shells with adsorbent inner insulation) placed along the boundary of the project site during construction activities.

Noise Compatibility

PDF 9-3 As described in the proposed zoning for the project, prior to issuance of certificate of occupancy, the project applicant shall submit evidence to the satisfaction of the Director of Community Development that occupancy disclosure notices for units with patios and/or balconies that do not meet the 65 dBA CNEL are provided to all future tenants pursuant to the City's Noise Ordinance.

PDF 9-4 As described in the proposed zoning for the project, residential and active recreational areas shall be prohibited in the 65 dBA CNEL noise contour of the John Wayne Airport. In addition, as described in the proposed zoning for the project, prior to issuance of building permits, the project applicant for any project within the 60 dBA CNEL contour of the John Wayne Airport shall retain an acoustical engineer to prepare an acoustic analysis that identifies required building acoustical improvements (e.g., sound transmission class rated windows, doors, and attic baffling) to achieve the 45 dBA CNEL interior noise standard of Title 21 and Title 24 of the California Building Code. In addition to the 24-hour interior noise standard, the acoustic report shall detail compliance with the City's interior noise standard of 55 dBA L_{max} (10) for single-event noise generated by the loudest 10 percent of aircraft overflights at the John Wayne Airport. Parks within the 60 dBA CNEL noise contour shall include signage indicating their proximity to John Wayne Airport and related airport noise. The acoustic analysis shall be submitted to the Director of Community Development to ensure compliance.

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 5.9-1: CONSTRUCTION ACTIVITIES COULD RESULT IN TEMPORARY NOISE INCREASES IN THE VICINITY OF THE PROPOSED PROJECT. [THRESHOLD N-3]

Impact Analysis: Short-term construction noise impacts are expected from with demolition, site preparation, grading, and building 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. However, the amount of construction traffic is typically small in relation to the total daily traffic volumes on those roadway segments.

The second type of short-term noise impact is related to demolition, site preparation, grading, and/or physical construction. Construction is performed in distinct steps, each with 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 5.9-8 lists typical construction equipment noise levels recommended for noise-impact assessments, based on a distance of 50 feet between the equipment and a noise receptor.

Table 5.9-8
Construction Equipment Noise Emission Levels

Construction Equipment	Typical Noise Level (dBA) at 50 Feet from the Source	Construction Equipment	Typical Noise Level (dBA) at 50 Feet from the Source
Air Compressor	81	Pile-Driver (Impact)	101
Backhoe	80	Pile-Driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	71	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Inserter	85
Loader	85	Truck	88
Paver	89		

Source: FTA 2006.

Composite construction noise is best characterized by Bolt, Beranek, and Newman. According to their 1971 study, construction noise for development ranges from 71 to 89 dBA L_{eq} 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. Construction of individual developments associated with buildout of the IBC would temporally increase the ambient noise environment. However, the City of Irvine restricts the hours of construction activities to the least noise-sensitive portions of the day. Trucks, vehicles, and equipment that are making or involved with deliveries, loading, or transfer of materials, equipment service, or maintenance of any devices or appurtenances for or within any construction project in the City are also subject to these prohibitions.

PPP 9-1 and PDF 9-2 would reduce impacts associated with construction noise by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and that stationary-source equipment be placed as far as feasible from adjacent noise-sensitive land uses. Because construction activities associated with any individual development may occur near noise-sensitive receptors and noise disturbances may occur for prolonged periods of time, construction noise impacts from buildout of the IBC are considered potentially significant.

Subsequent Development Pursuant to the Proposed Project

Construction activities associated with the individual development projects would elevate daytime noise levels in the vicinity of noise-sensitive receptors within the IBC Vision Plan Area. Consequently, impacts associated with the individual development projects—Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin—would not differ significantly from the IBC Vision Plan. PPP 9-1 and PDF 9-2 would reduce noise from construction activities to the extent feasible by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and that stationary source equipment be placed as far as feasible from adjacent noise-sensitive land uses.

IMPACT 5.9-2 CONSTRUCTION OF THE PROPOSED PROJECT MAY GENERATE PERCEPTIBLE LEVELS OF VIBRATION AT ADJACENT VIBRATION-SENSITIVE LAND USES. [THRESHOLD N-2]

Impact Analysis: Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Construction equipment can produce vibration from vehicle travel as well as grading and building activities. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, and slight structural damage at the highest levels. Vibrations from construction activities rarely reach levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site. Table 5.9-9 lists vibration levels for construction equipment.

Table 5.9-9
Vibration Levels for Construction Equipment

Equipment	*Approximate Velocity Level at 25 Feet (VdB)*	*Approximate RMS[1] Velocity at 25 Feet (in/sec)*
Pile Driver (impact) Upper Range	112	1.518
Pile Driver (impact) Lower Range	104	0.644
Pile Driver (sonic) Upper Range	105	0.734
Pile Driver (sonic) Lower Range	93	0.170
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Jackhammer	79	0.035
Small Bulldozer	58	0.003
Loaded Trucks	86	0.076
FTA Criteria – Human Annoyance (Daytime)	78	—
FTA Criteria – Structural Damage	—	0.200 Wood-Framed 0.500 Reinforced Masonry

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

As shown in Table 5.9-9, vibration generated by construction equipment has the potential to be substantial for both vibration annoyance and structural damage if it occurs proximate to vibration-sensitive uses. However, groundborne vibration is almost never annoying to people who are outdoors,

so it is usually evaluated in terms of indoor receivers (FTA 2006). PPP 9-1 and PDF 9-2 would reduce impacts associated with perceptible levels of vibration annoyance by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and that stationary-source equipment be placed as far as feasible from adjacent vibration-sensitive land uses. In addition, PDF 9-1 would ensure that less vibration-intensive equipment or construction techniques are used. Because of the potential for construction activities to occur in close proximity to vibration-sensitive uses and structures, vibration generated by the project could result in a significant impact. Significant vibration impacts may occur from construction equipment associated with new development within the IBC, especially if vibration-intensive equipment, such as pile drivers, is required. Impacts are considered potentially significant.

Subsequent Development Pursuant to the Proposed Project

Construction activities associated with the individual development projects could generate substantial vibration levels. Consequently, impacts associated with the individual development projects—Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin—would not differ significantly from the IBC Vision Plan. PPP 9-1 and PDF 9-2 would reduce impacts associated with perceptible levels of vibration annoyance by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and that stationary-source equipment be placed as far as feasible from adjacent vibration-sensitive land uses. In addition, PDF 9-1 would ensure that less vibration-intensive equipment or construction techniques would be used. However, because new development may occur near noise-sensitive land uses and could generate substantial vibration levels for an extended period of time, impacts are considered significant.

IMPACT 5.9-3 ***PROJECT-RELATED VEHICLE TRIPS WOULD SUBSTANTIALLY INCREASE AMBIENT NOISE AT NOISE-SENSITIVE RECEPTORS IN THE VICINITY OF THE PROJECT SITE ON MCGAW AVENUE BETWEEN JAMBOREE ROAD AND MURPHY AVENUE AND CUMULATIVELY ON VALENCIA AVENUE BETWEEN NEWPORT AVENUE AND RED HILL AVENUE, WARNER AVENUE BETWEEN SR-55 AND RED HILL AVENUE, MCGAW AVENUE BETWEEN JAMBOREE ROAD AND MURPHY AVENUE, AND BIRCH STREET BETWEEN MESA DRIVE AND BRISTOL STREET. [THRESHOLDS N-1 AND N-3]***

Impact Analysis: Long-term operation of the project could potentially result in two types of long-term noise impacts. The first impact may occur if the project substantially increases noise levels in the vicinity. Project-related noise sources include stationary sources such as heating, ventilation, and air conditioning (HVAC) units from residential units and parking lots (see Impact 5.9-4), and mobile sources such as project-generated traffic. The second type of long-term noise impact may occur if the project sites noise-sensitive uses such as residences in an area of high noise exposure (see Impact 5.9-5 for roadway noise and Impact 5.9-6 for airport noise). The following describes long-term mobile-source noise impacts associated with the project.

Mobile-Source Noise Impacts

Traffic noise modeling was conducted for interim year 2015 and post-year 2030 using the FHWA's Highway Traffic Noise Prediction model (FHWA RD-77-108) using a standard vehicle mix for Orange County roadways based on fleet mix for State Route 55 (Caltrans 2009). Based on the traffic study prepared for this project by Parson Brinkerhoff (December 2009), buildout of the IBC, which includes 17,038 residential units, 48,787,662 square feet of nonresidential, and 3,478 hotel rooms, would generate 697,308 ADT. Land uses in the IBC currently generate 508,690 trips. Consequently, the project would generate an increase of 188,618 trips in the IBC at full buildout in post-year 2030.

The modeled 24-hour CNEL traffic noise levels are shown in Table 5.9-10 as modeled at 50 feet from the roadway centerline for 2015 conditions. Table 5.9-11 show these levels for post-year 2030 conditions. Noise levels in Tables 5.9-10 and 5.9-11 represent the worst-case scenario, which assumes no shielding is provided between the traffic and the location where the noise contours are drawn.

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Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Anton Boulevard								
Bristol Street to Sunflower Avenue	7,620	67.9	8,200	68.2	8,200	68.2	0.3	0
Baker Street								
Bear Street to Bristol Street	23,497	73.9	25,400	74.2	25,900	74.3	0.4	0.1
Bristol Street to SR-55 SB Ramps	27,498	74.6	30,200	75.0	30,700	75.1	0.5	0.1
SR-55 SB to SR-55 NB	24,275	74.0	28,000	74.7	28,500	74.7	0.7	0.1
SR-55 NB to Red Hill Avenue	13,718	71.6	15,800	72.2	16,300	72.3	0.7	0.1
Red Hill Avenue to Airway Avenue	4,699	66.9	5,700	67.7	5,700	67.7	0.8	0
Bear Street								
Paularino Avenue to Baker Street	17,577	72.6	18,300	72.8	18,400	72.8	0.2	0
Bristol Street								
Segerstrom Avenue to West Alton Avenue	35,789	75.7	36,100	75.8	36,300	75.8	0.1	0
West Alton Avenue to MacArthur Boulevard	38,850	76.1	40,400	76.3	40,600	76.3	0.2	0
MacArthur Boulevard to Sunflower Avenue	22,305	73.7	23,100	73.8	23,100	73.8	0.2	0
Sunflower Avenue to Anton Boulevard	42,108	76.4	43,200	76.5	43,200	76.5	0.1	0
Anton Boulevard to I-405 NB Ramps	62,602	78.2	64,600	78.3	64,600	78.3	0.1	0
I-405 NB Ramps to I-405 SB Ramps	63,048	78.2	64,500	78.3	64,700	78.3	0.1	0
I-405 SB Ramp to Paularino Avenue	40,727	76.3	43,400	76.6	43,400	76.6	0.3	0
Paularino Avenue to Baker Street	34,095	75.5	35,500	75.7	35,600	75.7	0.2	0
Baker Street to SR-55	24,713	74.1	25,600	74.3	25,700	74.3	0.2	0
SR-55 to Red Hill Avenue	20,914	73.4	22,000	73.6	22,400	73.7	0.3	0.1
Del Mar Avenue								
Newport Boulevard SB to Newport Boulevard NB	12,232	71.1	13,300	71.4	13,400	71.5	0.4	0
Newport Boulevard to Santa Ana Avenue	7,069	68.7	7,300	68.8	7,300	68.8	0.1	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Flower Street								
Segerstrom Avenue to MacArthur Boulevard	9,756	70.1	10,100	70.2	10,200	70.3	0.2	0
MacArthur Boulevard to Sunflower Avenue	8,180	69.3	8,500	69.5	8,500	69.5	0.2	0
Sunflower Avenue to Anton Boulevard	6,193	68.1	6,500	68.3	6,400	68.2	0.1	-0.1
Main Street								
Sunflower Avenue to SR-55	20,195	73.2	21,400	73.5	22,100	73.6	0.4	0.1
Mesa Drive								
Newport Boulevard SB to Newport Boulevard NB	5,469	67.6	5,800	67.8	5,800	67.8	0.3	0
Newport Boulevard NB to Santa Ana Avenue	5,674	67.7	6,000	68.0	6,100	68.0	0.3	0.1
Irvine Avenue to Birch Street	8,487	69.5	9,000	69.7	9,200	69.8	0.4	0.1
Paularino Avenue								
Bear Street to Bristol Street	7,632	66.8	8,100	67.0	8,200	67.1	0.3	0.1
Bristol Street to SR-55 SB	16,284	70.1	18,100	70.5	18,100	70.5	0.5	0
SR-55 SB to SR-55 NB	15,141	69.7	18,200	70.5	18,400	70.6	0.8	0
SR-55 NB to Red Hill Avenue	3,967	63.9	5,200	65.1	5,200	65.1	1.2	0
Red Hill Avenue to Airway Avenue	10,781	68.3	13,300	69.2	13,300	69.2	0.9	0
Red Hill Avenue								
Main Street to Paularino Avenue	16,060	72.2	18,600	72.9	19,200	73.0	0.8	0.1
Paularino Avenue to Baker Street	15,961	72.2	19,600	73.1	20,200	73.2	1.0	0.1
Baker Street to Bristol Street	14,182	71.7	16,700	72.4	16,700	72.4	0.7	0
Santa Ana Avenue								
Mesa Drive to Bristol Street	9,020	67.5	9,400	67.7	9,300	67.6	0.1	0
University Drive								
Santa Ana Avenue to Irvine Avenue	5,684	68.7	5,900	68.9	6,000	69.0	0.2	0.1

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Alton Parkway								
Daimler Street to Red Hill Avenue	4,578	67.8	4,700	67.9	4,700	67.9	0.1	0.0
Red Hill Avenue to Von Karman Avenue	12,332	72.1	12,500	72.2	13,000	72.3	0.2	0.2
Von Karman Avenue to Jamboree Road	14,649	72.9	15,700	73.2	16,100	73.3	0.4	0.1
Jamboree Road to Murphy Avenue	15,133	73.0	16,500	73.4	16,900	73.5	0.5	0.1
Murphy Avenue to Harvard Avenue	15,645	73.1	17,100	73.5	17,600	73.6	0.5	0.1
Harvard Avenue to Paseo Westpark	15,465	73.1	16,600	73.4	16,800	73.4	0.4	0.1
Paseo Westpark to San Marino	12,620	72.2	13,800	72.6	14,000	72.7	0.5	0.1
San Marino to Culver Drive	21,617	74.5	23,300	74.9	23,300	74.9	0.3	0
Barranca Parkway (Dyer)								
Pullman to Red Hill Avenue	24,454	75.1	25,100	75.2	25,800	75.3	0.2	0.1
Red Hill Avenue to Armstrong	30,266	76.0	27,100	75.5	30,300	76.0	0	0.5
Armstrong to Von Karman Avenue	29,815	75.9	29,800	75.9	29,800	75.9	0	0
Von Karman Avenue to Jamboree Road	22,039	74.6	22,000	74.6	22,300	74.7	0.1	0.1
Jamboree Road to Construction Circle	24,517	75.1	27,500	75.6	27,600	75.6	0.5	0
Construction Circle to Harvard Avenue	21,003	74.4	24,200	75.0	24,300	75.0	0.6	0
Harvard Avenue to Paseo Westpark	19,905	74.2	22,800	74.8	22,800	74.8	0.6	0
Paseo Westpark to Santa Rosa	21,004	74.4	24,200	75.0	24,300	75.0	0.6	0
Santa Rosa to Culver Drive	21,643	74.5	24,600	75.1	24,700	75.1	0.6	0
Bryan Avenue								
Jamboree Road to Marketplace	21,001	74.4	22,400	74.7	22,400	74.7	0.3	0
Marketplace to El Camino Real	17,921	73.7	20,800	74.4	20,800	74.4	0.6	0
El Camino Real to Rubicon	14,726	72.9	17,400	73.6	17,300	73.6	0.7	0
Rubicon to Culver Drive	18,343	73.8	23,100	74.8	23,000	74.8	1.0	0
Campus Drive								
MacArthur Boulevard to Martin	16,279	71.2	17,400	71.5	19,100	71.9	0.7	0.4
Martin to Von Karman Avenue	12,892	70.2	13,700	70.5	15,100	70.9	0.7	0.4
Von Karman Avenue to Teller Avenue	11,823	69.8	12,600	70.1	14,000	70.6	0.7	0.5

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Teller Avenue to Jamboree Road	10,315	69.2	10,900	69.5	11,600	69.7	0.5	0.3
Jamboree Road to Carlson Avenue	20,089	75.2	21,400	75.4	22,300	75.6	0.5	0.2
Carlson Avenue to University Drive	18,247	74.7	18,900	74.9	19,300	75.0	0.2	0.1
Carlson Avenue								
Michelson Drive to Campus Drive	3,901	68.0	5,300	69.4	5,700	69.7	1.6	0.3
Culver Drive								
I-5 NB Ramps to I-5 SB Ramps	36,738	76.8	44,200	77.6	44,000	77.6	0.8	0
I-5 SB Off-Ramp to Scottsdale Drive	49,687	78.2	54,800	78.6	54,800	78.6	0.4	0
Scottsdale Drive to Walnut Avenue	44,077	77.6	48,500	78.1	48,600	78.1	0.4	0
Walnut Avenue to Deerfield Avenue	42,201	77.4	44,300	77.7	44,500	77.7	0.2	0
Deerfield Avenue to Irvine Center Drive	38,904	77.1	41,100	77.3	41,100	77.3	0.2	0
Irvine Center Drive to Warner Avenue	41,580	77.4	43,100	77.5	43,100	77.5	0.2	0
Warner Avenue to Barranca Parkway	40,870	77.3	43,300	77.6	43,600	77.6	0.3	0
Barranca Parkway to Alton Parkway	44,253	77.7	47,000	77.9	47,500	78.0	0.3	0
Alton Parkway to Main Street	45,204	77.7	48,000	78.0	48,600	78.1	0.3	0.1
Main Street to San Leandro	49,711	78.2	51,500	78.3	52,000	78.4	0.2	0
San Leandro to I-405 NB On-Ramp	54,428	78.6	56,100	78.7	56,600	78.7	0.2	0
I-405 SB On-Ramp to Michelson Drive	53,319	78.5	57,100	78.8	57,900	78.8	0.4	0.1
Michelson Drive to Sandburg Way	39,658	77.2	43,100	77.5	43,400	77.6	0.4	0
Sandburg Way to University Drive	32,408	76.3	35,600	76.7	35,800	76.7	0.4	0
El Camino Real								
Jamboree Road to Alliance	20,876	73.4	22,800	73.8	22,800	73.8	0.4	0
Fairchild Road								
MacArthur Boulevard to Jamboree Road	4,393	67.6	4,500	67.7	4,500	67.7	0.1	0
Harvard Avenue								
Walnut Avenue to Poplar Street	9,179	70.8	9,600	71.0	9,700	71.1	0.2	0
Poplar Street to Deerfield Avenue	11,387	71.8	11,700	71.9	11,700	71.9	0.1	0
Deerfield Avenue to Irvine Center Drive	10,273	71.3	10,800	71.5	10,800	71.5	0.2	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Irvine Center Drive to Paseo Westpark	12,508	72.2	12,900	72.3	13,100	72.4	0.2	0.1
Paseo Westpark to Warner Avenue	11,065	71.6	12,700	72.2	12,800	72.3	0.6	0
Warner to Barranca Parkway	12,686	72.2	15,000	73.0	15,100	73.0	0.8	0
Barranca Parkway to San Juan	15,295	73.0	17,100	73.5	17,300	73.6	0.5	0.1
San Juan to San Leon	14,888	72.9	16,200	73.3	16,600	73.4	0.5	0.1
San Leon to Alton Parkway	16,362	73.3	17,900	73.7	18,200	73.8	0.5	0.1
Alton Parkway to San Marino	18,655	73.9	20,500	74.3	21,100	74.4	0.5	0.1
San Marino to Main Street	19,291	74.0	21,100	74.4	21,800	74.6	0.5	0.1
Main Street to Coronado	13,552	72.5	14,700	72.9	15,400	73.1	0.6	0.2
Coronado to Michelson Drive	20,167	74.2	21,500	74.5	22,700	74.8	0.5	0.2
Michelson Drive to University Drive	8,672	70.6	9,300	70.9	9,800	71.1	0.5	0.2
Irvine Center Drive								
Harvard Avenue to Hearthstone	17,848	73.7	20,700	74.4	20,900	74.4	0.7	0
Hearthstone to Culver Drive	15,815	73.2	19,200	74.0	19,400	74.1	0.9	0
Jamboree Road								
Bryan Avenue to El Camino Real	39,163	77.1	39,200	77.1	39,200	77.1	0	0
El Camino Real to I-5 NB On-Ramp	61,511	79.1	61,500	79.1	61,500	79.1	0	0
I-5 NB Ramps to I-5 SB Off-Ramp	65,707	79.4	66,700	79.4	66,500	79.4	0.1	0
I-5 SB Off-Ramp to Michelle Drive	57,976	78.8	61,300	79.1	61,100	79.1	0.2	0
Michelle Drive to Walnut Avenue	54,497	78.6	54,500	78.6	54,500	78.6	0	0
Walnut Ave to Edinger Ave (& Frontage Rds.)	71,936	79.8	71,900	79.8	71,900	79.8	0	0
Edinger Avenue to Warner Avenue*	78,493	80.1	78,500	80.1	78,500	80.1	0	0
Warner Avenue to Barranca Parkway	69,451	79.6	73,900	79.9	74,500	79.9	0.3	0
Barranca Parkway to Beckman Avenue	50,727	78.2	54,300	78.5	55,200	78.6	0.4	0.1
Beckman Avenue to Alton Parkway	49,220	78.1	51,900	78.3	52,800	78.4	0.3	0.1
Alton Parkway to McGaw Avenue	46,536	77.9	49,400	78.1	51,600	78.3	0.4	0.2
McGaw Avenue to Kelvin Avenue	45,004	77.7	47,700	78.0	50,200	78.2	0.5	0.2
Kelvin Avenue to Main Street	53,259	78.5	56,100	78.7	59,900	79.0	0.5	0.3

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Main Street to I-405 Off-Ramp	52,524	78.4	54,100	78.5	58,300	78.9	0.5	0.3
I-405 On-Ramp to Michelson Drive	69,470	79.6	72,300	79.8	79,900	80.2	0.6	0.4
Michelson Drive to Dupont Drive	51,529	78.3	53,000	78.4	60,100	79.0	0.7	0.5
Dupont Drive to Campus Drive	45,645	77.8	46,900	77.9	49,800	78.2	0.4	0.3
Campus Drive to Birch Street	40,300	77.2	41,800	77.4	44,600	77.7	0.4	0.3
Birch Street to Fairchild Road	32,438	76.3	33,600	76.5	35,700	76.7	0.4	0.3
Fairchild Road to Koll Center	33,237	76.4	34,200	76.5	36,400	76.8	0.4	0.3
Koll Center to MacArthur Boulevard	26,722	75.5	27,500	75.6	29,200	75.8	0.4	0.3
MacArthur Boulevard								
Fitch to Red Hill Avenue	35,926	76.7	37,500	76.9	39,100	77.1	0.4	0.2
Red Hill Avenue to Skypark Boulevard	15,788	73.2	16,200	73.3	17,200	73.5	0.4	0.3
Skypark Boulevard to Main Street	25,505	75.3	26,200	75.4	27,600	75.6	0.3	0.2
Main Street to I-405 NB Off-Ramp	33,677	76.5	34,700	76.6	36,600	76.8	0.4	0.2
I-405 SB On-Ramp to Michelson Drive	48,662	78.1	50,300	78.2	53,000	78.4	0.4	0.2
Michelson Drive to Douglass	40,604	77.3	41,800	77.4	42,300	77.5	0.2	0.1
Douglass to Campus Drive	33,358	76.4	34,600	76.6	34,800	76.6	0.2	0.0
Jamboree Road to Fairchild Road	30,151	76.0	31,800	76.2	32,400	76.3	0.3	0.1
Fairchild Road to University Drive	34,000	76.5	35,600	76.7	36,200	76.8	0.3	0.1
Main Street								
McDurmott to Red Hill Avenue	18,121	73.8	18,900	74.0	19,500	74.1	0.3	0.1
Red Hill Avenue to Executive Park	16,818	73.5	17,700	73.7	18,500	73.9	0.4	0.2
Executive Park to MacArthur Boulevard	26,160	75.4	27,200	75.5	28,400	75.7	0.4	0.2
MacArthur Boulevard to Mercantile	35,615	76.7	36,000	76.8	37,100	76.9	0.2	0.1
Gillette Avenue to Von Karman Avenue	17,820	73.7	18,700	73.9	19,800	74.2	0.5	0.2
Von Karman Avenue to Cartwright	16,082	73.3	16,900	73.5	17,900	73.7	0.5	0.2
Siglo to Jamboree Road	22,024	74.6	22,700	74.8	24,700	75.1	0.5	0.4
Jamboree Road to Union	19,037	74.0	19,600	74.1	20,200	74.2	0.3	0.1
Veneto to Harvard Avenue	10,456	71.4	11,200	71.7	11,600	71.8	0.5	0.2

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Harvard Avenue to San Mateo	11,382	71.8	12,100	72.0	12,300	72.1	0.3	0.1
Paseo Westpark to Culver Drive	8,757	70.6	9,600	71.0	9,600	71.0	0.4	0
McGaw Avenue								
Daimler Street to Red Hill Avenue	3,630	66.8	3,600	66.8	3,600	66.8	0	0
Red Hill Avenue to Von Karman Avenue	5,653	68.7	5,700	68.8	6,100	69.0	0.3	0.3
Von Karman Avenue to Jamboree Road	6,451	69.3	6,600	69.4	7,000	69.6	0.4	0.3
Jamboree Road to Murphy Avenue	2,462	65.1	2,600	65.3	3,500	66.6	1.5	1.3
Michelson Drive								
MacArthur Boulevard to Dupont Drive	14,917	71.9	15,100	72.0	17,200	72.5	0.6	0.6
Bixby to Von Karman Avenue	10,836	70.5	11,400	70.8	13,000	71.3	0.8	0.6
Von Karman Avenue to Obsidian	10,559	70.4	11,100	70.6	12,800	71.3	0.8	0.6
Teller Avenue to Jamboree Road	17,973	72.7	18,400	72.8	20,400	73.3	0.6	0.4
Jamboree Road to Carlson Avenue	14,864	71.9	16,500	72.4	19,100	73.0	1.1	0.6
Carlson Avenue to Prince	16,704	72.4	17,200	72.5	20,200	73.2	0.8	0.7
Riparian View to Harvard Avenue	16,553	72.4	17,500	72.6	18,900	73.0	0.6	0.3
Harvard Avenue to Parkside Drive	11,741	70.9	12,500	71.2	13,100	71.4	0.5	0.2
Parkside Drive to Culver Drive	16,629	72.4	17,600	72.6	18,400	72.8	0.4	0.2
Red Hill Avenue								
Dyer/Barranca Parkway to Deere Avenue	26,611	75.4	26,700	75.5	27,300	75.6	0.1	0.1
Deere Avenue to Alton Parkway	26,630	75.4	27,200	75.5	27,800	75.6	0.2	0.1
Alton Parkway to McGaw Avenue	26,216	75.4	30,000	76.0	30,900	76.1	0.7	0.1
McGaw Avenue to MacArthur Boulevard	34,187	76.5	37,400	76.9	38,400	77.0	0.5	0.1
MacArthur Boulevard to Skypark	9,780	71.1	11,400	71.8	11,800	71.9	0.8	0.1
Skypark to Main Street	12,554	72.2	14,400	72.8	14,800	72.9	0.7	0.1
University Drive								
MacArthur Boulevard to California Avenue	23,581	75.9	24,800	76.1	25,100	76.1	0.3	0.1
California Avenue to Mesa Road	32,837	77.3	34,600	77.5	35,100	77.6	0.3	0.1
Mesa Road to Campus Drive	33,673	75.5	35,900	75.7	36,300	75.8	0.3	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Campus Drive to Harvard Avenue	26,248	74.4	28,700	74.8	29,000	74.8	0.4	0
Harvard Avenue to San Joaquin Hills Road	21,301	75.4	24,200	76.0	24,300	76.0	0.6	0
San Joaquin Hills Road to Culver Drive	21,676	75.5	24,600	76.0	24,700	76.1	0.6	0
Von Karman Avenue								
Barranca Parkway to Alton Parkway	16,770	72.4	24,200	74.0	25,100	74.2	1.8	0.2
Alton Parkway to McGaw Avenue	16,349	72.3	19,400	73.1	20,400	73.3	1.0	0.2
McGaw Avenue to Anchor	17,271	72.6	19,700	73.1	20,700	73.3	0.8	0.2
Anchor to Main Street	17,763	72.7	19,900	73.2	21,200	73.5	0.8	0.3
Main Street to Morse Avenue	18,765	72.9	20,500	73.3	22,000	73.6	0.7	0.3
Quartz to Michelson Drive	20,193	73.2	21,900	73.6	23,700	73.9	0.7	0.3
Michelson Drive to Dupont Drive	16,840	72.5	17,800	72.7	19,000	73.0	0.5	0.3
Dupont Drive to Martin	16,346	72.3	17,000	72.5	18,200	72.8	0.5	0.3
Martin to Campus Drive	14,234	71.7	14,800	71.9	15,800	72.2	0.5	0.3
Walnut Avenue								
Myford to Jamboree SB Off-Ramp	21,169	73.4	21,200	73.5	21,300	73.5	0.0	0
Jamboree Road to Peters Canyon	18,580	72.9	21,900	73.6	21,900	73.6	0.7	0
Peters Canyon to Harvard Avenue	18,125	72.8	20,600	73.3	20,700	73.3	0.6	0
Harvard Avenue to Mall Street	16,040	72.2	18,500	72.9	18,500	72.9	0.6	0
Mall Street to Culver Drive	20,951	73.4	24,200	74.0	24,400	74.1	0.7	0
Warner Avenue								
Construction North to Harvard Avenue	8,225	69.3	11,800	70.9	11,900	70.9	1.6	0
Harvard Avenue to Paseo Westpark	5,766	67.8	8,100	69.3	8,000	69.2	1.4	-0.1
Santa Ynez to Culver Drive	6,493	68.3	8,700	69.6	8,600	69.5	1.2	-0.1
Birch Street								
Mesa Drive to Bristol Street SB	10,372	69.3	11,200	69.6	11,400	69.7	0.4	0.1
Bristol Street SB to Bristol Street NB	15,579	71.0	16,000	71.1	16,200	71.2	0.2	0.1
East of MacArthur Boulevard	20,327	72.2	20,800	72.3	22,300	72.6	0.4	0.3

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
West of MacArthur Boulevard	11,707	69.8	12,000	69.9	12,900	70.2	0.4	0.3
East of Von Karman Avenue	20,327	72.2	20,800	72.3	22,400	72.6	0.4	0.3
Bison Avenue								
Jamboree Road to MacArthur Boulevard	9,087	69.8	9,800	70.1	9,900	70.1	0.4	0
MacArthur Boulevard to SR-73	13,411	71.5	13,900	71.6	13,800	71.6	0.1	0
Bristol								
Red Hill Avenue to Campus Drive*	20,119	73.2	21,400	73.5	22,100	73.6	0.4	0.1
Campus Drive to Birch Street*	33,382	75.4	34,900	75.6	35,200	75.7	0.2	0
West of Jamboree Road*	42,491	76.5	44,200	76.6	44,500	76.7	0.2	0
Campus Drive								
Bristol Street NB to MacArthur Boulevard	27,671	75.6	28,800	75.8	30,300	76.0	0.4	0.2
Ford Road								
Jamboree Road to MacArthur Boulevard	9,051	70.8	10,000	71.2	9,900	71.2	0.4	0
Irvine Avenue								
Bristol Street NB to Bristol Street SB	22,879	73.8	23,700	73.9	24,600	74.1	0.3	0.2
Bristol Street SB to Mesa Drive	24,237	74.0	25,200	74.2	25,500	74.3	0.2	0.1
South of University Drive	22,253	73.7	23,200	73.8	23,500	73.9	0.2	0.1
Jamboree Road								
South of MacArthur Boulevard	28,826	75.8	29,500	75.9	30,700	76.1	0.3	0.2
Bristol Street SB to Bristol Street NB	46,597	77.9	47,600	78.0	48,500	78.1	0.2	0.1
South of Bristol Street	48,897	78.1	50,500	78.2	51,200	78.3	0.2	0.1
University Drive to Bison Avenue	42,624	77.5	44,300	77.7	44,900	77.7	0.2	0.1
Bison Avenue to Ford Road	33,614	76.5	34,800	76.6	35,100	76.6	0.2	0
MacArthur Boulevard								
Campus Drive to Birch Street	21,187	74.5	22,100	74.6	21,900	74.6	0.1	0
South of Birch Street	23,445	74.9	24,700	75.1	24,600	75.1	0.2	0
Von Karman Avenue to Jamboree Road	23,568	74.9	25,000	75.2	25,000	75.2	0.3	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
University Drive to Bison Avenue	43,429	77.6	45,600	77.8	45,700	77.8	0.2	0
Bison Avenue to Ford Road	75,856	80.0	78,700	80.2	78,700	80.2	0.2	0
University Drive								
East of Irvine Avenue	823	60.3	800	60.2	800	60.2	-0.1	0
Jamboree Road to MacArthur Boulevard	14,628	72.8	15,400	73.1	15,600	73.1	0.3	0.1
Von Karman Avenue								
South of Campus Drive	10,305	71.3	10,800	71.5	11,100	71.6	0.3	0.1
South of Birch Street	11,237	71.7	11,700	71.9	12,100	72.0	0.3	0.1
Dyer Road								
Main Street to Halladay Street	25,688	75.3	27,400	75.6	27,800	75.6	0.3	0.1
Halladay Street to SR-55 SB	30,243	76.0	31,800	76.2	32,400	76.3	0.3	0.1
SR-55 SB to SR-55 NB	43,265	77.6	43,600	77.6	44,400	77.7	0.1	0.1
SR-55 NB to Pullman Street	29,458	75.9	30,000	76.0	30,600	76.1	0.2	0.1
Grand Avenue								
Warner Avenue to Hotel Terrace Drive	22,946	74.8	22,900	74.8	22,900	74.8	0	0
Hotel Terrace Drive to SR-55 NB	21,501	74.5	21,500	74.5	21,500	74.5	0	0
Halladay Street								
Dyer Road to Alton Avenue	4,687	64.6	5,500	65.3	5,600	65.4	0.8	0.1
Alton Avenue to McGaw Avenue (Columbine)	1,748	60.4	2,100	61.2	2,100	61.2	0.8	0
MacArthur Boulevard								
Flower Street to Main Street	31,093	76.1	32,100	76.3	32,400	76.3	0.2	0
Main Street to SR-55 SB	47,010	77.9	49,900	78.2	50,800	78.3	0.3	0.1

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Main Street								
Segerstrom Avenue to Alton Avenue	20,603	74.3	21,600	74.5	21,900	74.6	0.3	0.1
Alton Avenue to McGaw Avenue(Columbine)	23,743	74.9	24,600	75.1	24,900	75.2	0.2	0.1
McGaw(Columbine) to MacArthur Boulevard	28,675	75.8	29,100	75.8	29,400	75.9	0.1	0
MacArthur Boulevard to Sunflower Avenue	30,103	76.0	30,600	76.1	30,800	76.1	0.1	0
McGaw Avenue (Alton)								
Main Street to Halladay Street	3,092	66.1	3,100	66.1	3,100	66.1	0	0
Segerstrom Avenue								
Bristol Street to Flower Street	11,560	70.8	12,200	71.1	12,400	71.1	0.3	0.1
Flower Street to Main Street	18,676	72.9	19,600	73.1	19,800	73.2	0.3	0
Warner Avenue								
Grand Avenue to SR-55	18,190	73.8	28,900	75.8	29,200	75.8	2.1	0
Sunflower Avenue								
Bristol Street to Flower Street	40,204	76.2	40,500	76.3	41,100	76.3	0.1	0.1
Flower Street to Anton Boulevard	18,032	72.7	18,300	72.8	18,900	73.0	0.2	0.1
Anton Boulevard to Main Street	19,454	73.1	20,600	73.3	21,400	73.5	0.4	0.2
Browning Avenue								
Walnut Avenue to I-5	4,501	65.6	5,000	66.1	5,000	66.1	0.5	0
Bryan Avenue								
Newport Boulevard to Red Hill Avenue	15,300	73.0	16,200	73.3	16,200	73.3	0.2	0
Red Hill Avenue to Browning	16,200	73.3	17,400	73.6	17,400	73.6	0.3	0
Browning Avenue to Tustin Ranch Road	16,700	73.4	18,400	73.8	18,500	73.9	0.4	0
Tustin Ranch Road to Jamboree Road	16,800	73.4	18,400	73.8	18,400	73.8	0.4	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Edinger Avenue								
West of Newport Avenue	34,312	77.5	40,800	78.2	40,900	78.3	0.8	0
Newport Avenue to Red Hill Avenue	20,215	75.2	22,200	75.6	22,300	75.6	0.4	0
Red Hill Avenue and Tustin Ranch Road	22,340	76.5	25,800	77.1	26,000	77.2	0.7	0
El Camino Real								
Newport Avenue to Red Hill Avenue	13,735	71.6	13,700	71.6	13,700	71.6	0	0
Red Hill Avenue to Browning Avenue	8,973	69.7	10,800	70.5	10,800	70.5	0.8	0
Browning Avenue to Tustin Ranch Road	8,392	69.4	9,500	70.0	9,500	70.0	0.5	0
Tustin Ranch Road to Jamboree Road	13,574	71.5	15,000	71.9	15,100	72.0	0.5	0
Irvine Center Drive								
Red Hill Avenue to Jamboree Road	22,340	75.6	23,300	75.8	23,600	75.9	0.2	0.1
Jamboree Road to Harvard Avenue	13,952	73.6	15,400	74.0	15,700	74.1	0.5	0.1
Mitchell Avenue								
Newport Avenue to Red Hill Avenue	7,350	66.6	7,400	66.6	7,400	66.6	0	0
Red Hill Avenue to Browning Avenue	4,417	64.4	4,400	64.4	4,400	64.4	0	0
Newport Avenue								
El Camino Real to I-5	28,516	72.5	34,200	73.3	34,400	73.3	0.8	0
I-5 to Mitchell Avenue	31,417	72.9	37,200	73.6	37,300	73.7	0.7	0
Mitchell Avenue to McFadden Avenue	29,223	72.6	35,600	73.5	35,600	73.5	0.9	0
North of Sycamore Avenue	9,604	67.8	19,500	70.8	19,400	70.8	**3.1**	0
Valencia Avenue to Edinger Avenue	18,205	70.5	27,600	72.3	27,300	72.3	1.8	0
Nisson Road								
Newport Avenue to Red Hill Avenue	5,593	65.4	5,600	65.4	5,600	65.4	0	0
Red Hill Avenue to Browning Avenue	3,915	63.9	4,100	64.1	4,100	64.1	0.2	0
Red Hill Avenue								
I-5 NB Ramps to El Camino Real	43,222	74.3	44,300	74.4	44,100	74.4	0.1	0
I-5 SB Ramps to I-5 NB Ramps	38,996	73.8	41,000	74.1	40,800	74.0	0.2	0
Nisson Road to I-5 SB	38,235	73.8	38,200	73.8	38,200	73.8	0	0

Table 5.9-10
2015 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Year 2015 Without Project		Year 2015 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing (Cumulative Impacts)	Due to the Project (Project Impacts)
Nisson Road to Mitchell Avenue	26,681	72.2	26,700	72.2	26,700	72.2	0	0
Mitchell Avenue to Walnut Avenue	25,830	72.1	25,800	72.1	25,800	72.1	0	0
Walnut Avenue to Sycamore Avenue	27,502	73.5	23,900	72.9	23,900	72.9	-0.6	0
Sycamore Avenue to Edinger Avenue	29,957	73.9	24,600	73.0	24,600	73.0	-0.9	0
Edinger Avenue to Valencia Avenue	25,507	73.2	25,500	73.2	25,500	73.2	0.0	0
Valencia Avenue to Warner Avenue	26,723	75.5	26,700	75.5	26,900	75.5	0.0	0
Warner Avenue to Barranca Parkway/Dyer	29,570	75.9	24,900	75.2	25,300	75.2	-0.7	0.1
Sycamore Avenue								
SR-55 NB to Newport Avenue	9,036	67.5	9,100	67.5	9,400	67.7	0.2	0.1
Newport Avenue to Red Hill Avenue	7,758	66.8	8,800	67.4	8,900	67.4	0.6	0
Tustin Ranch Road								
North of I-5	32,560	76.3	42,600	77.5	42,500	77.5	1.2	0
I-5 to Walnut Avenue	21,087	74.4	36,000	76.8	35,800	76.7	2.3	0
Valencia Avenue								
Newport Avenue to Red Hill Avenue	3,690	65.9	10,100	70.2	10,300	70.3	**4.5**	0.1
Walnut Avenue								
East of Newport Avenue	15,375	72.1	16,700	72.4	16,800	72.4	0.4	0
East of Red Hill Avenue	15,579	72.1	16,100	72.3	16,100	72.3	0.1	0
West of Tustin Ranch Road	19,862	73.2	21,900	73.6	21,900	73.6	0.4	0
Franklin Avenue to Myford Road	18,249	72.8	18,500	72.9	18,600	72.9	0.1	0
Warner Avenue								
SR-55 to Red Hill Avenue	13,682	72.6	27,600	75.6	28,100	75.7	**3.1**	0.1

Source: FHWA Traffic Noise Prediction Model. Based on traffic volumes obtained from the traffic analysis prepared by Parson Brinkerhoff (December 2009) and speed limits obtained from Google Maps.
NB: northbound; SB: southbound; EB: eastbound; WB: westbound

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Anton Boulevard								
Bristol Street to Sunflower Avenue	7,620	67.9	10,100	69.1	10,200	69.2	1.3	0
Baker Street								
Bear Street to Bristol Street	23,497	73.9	29,600	74.9	30,100	75.0	1.1	0.1
Bristol Street to SR-55 SB Ramps	27,498	74.6	36,300	75.8	37,000	75.9	1.3	0.1
SR-55 SB to SR-55 NB	24,275	74.0	37,800	76.0	38,200	76.0	2.0	0
SR-55 NB to Red Hill Avenue	13,718	71.6	21,500	73.5	22,000	73.6	2.1	0.1
Red Hill Avenue to Airway Avenue	4,699	66.9	6,200	68.1	6,200	68.1	1.2	0
Bear Street								
Paularino Avenue to Baker Street	17,577	72.6	19,900	73.2	20,100	73.2	0.6	0
Bristol Street								
Segerstrom Avenue to West Alton Avenue	35,789	75.7	40,400	76.3	41,200	76.3	0.6	0.1
West Alton Avenue to MacArthur Boulevard	38,850	76.1	44,200	76.6	45,000	76.7	0.6	0.1
MacArthur Boulevard to Sunflower Avenue	22,305	73.7	25,300	74.2	25,600	74.3	0.6	0.1
Sunflower Avenue to Anton Boulevard	42,108	76.4	44,400	76.7	45,300	76.7	0.3	0.1
Anton Boulevard to I-405 NB Ramps	62,602	78.2	69,500	78.6	70,500	78.7	0.5	0.1
I-405 NB Ramps to I-405 SB Ramps	63,048	78.2	69,900	78.6	71,000	78.7	0.5	0.1
I-405 SB Ramp to Paularino Avenue	40,727	76.3	50,600	77.2	51,100	77.3	1.0	0
Paularino Avenue to Baker Street	34,095	75.5	40,400	76.3	41,000	76.3	0.8	0.1
Baker Street to SR-55	24,713	74.1	25,100	74.2	25,600	74.3	0.2	0.1
SR-55 to Red Hill Avenue	20,914	73.4	23,000	73.8	23,700	73.9	0.5	0.1
Del Mar Avenue								
Newport Boulevard SB to Newport Boulevard NB	12,232	71.1	18,300	72.8	18,800	72.9	1.9	0.1
Newport Boulevard to Santa Ana Avenue	7,069	68.7	12,900	71.3	13,200	71.4	2.7	0.1

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Flower Street								
Segerstrom Avenue to MacArthur Boulevard	9,756	70.1	11,500	70.8	11,800	70.9	0.8	0.1
MacArthur Boulevard to Sunflower Avenue	8,180	69.3	13,100	71.4	13,300	71.4	2.1	0.1
Sunflower Avenue to Anton Boulevard	6,193	68.1	9,300	69.9	9,300	69.9	1.8	0
Main Street								
Sunflower Avenue to SR-55	20,195	73.2	24,400	74.1	27,200	74.5	1.3	0.5
Mesa Drive								
Newport Boulevard SB to Newport Boulevard NB	5,469	67.6	4,900	67.1	4,900	67.1	-0.5	0
Newport Boulevard NB to Santa Ana Avenue	5,674	67.7	4,800	67.0	4,700	66.9	-0.8	-0.1
Irvine Avenue to Birch Street	8,487	69.5	13,400	71.5	13,900	71.6	2.1	0.2
Paularino Avenue								
Bear Street to Bristol Street	7,632	66.8	8,400	67.2	8,500	67.2	0.5	0.1
Bristol Street to SR-55 SB	16,284	70.1	21,600	71.3	21,600	71.3	1.2	0
SR-55 SB to SR-55 NB	15,141	69.7	23,500	71.6	23,800	71.7	2.0	0.1
SR-55 NB to Red Hill Avenue	3,967	63.9	7,400	66.6	7,500	66.7	2.8	0.1
Red Hill Avenue to Airway Avenue	10,781	68.3	17,300	70.3	17,300	70.3	2.1	0
Red Hill Avenue								
Main Street to Paularino Avenue	16,060	72.2	19,300	73.0	20,800	73.4	1.1	0.3
Paularino Avenue to Baker Street	15,961	72.2	21,000	73.4	21,900	73.6	1.4	0.2
Baker Street to Bristol Street	14,182	71.7	23,500	73.9	23,900	74.0	2.3	0.1
Santa Ana Avenue								
Mesa Drive to Bristol Street	9,020	67.5	9,000	67.5	9,000	67.5	0	0
University Drive								
Santa Ana Avenue to Irvine Avenue	5,684	68.7	10,300	71.3	11,000	71.6	2.9	0.3

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Alton Parkway								
Daimler Street to Red Hill Avenue	4,578	67.8	4,600	67.8	6,500	69.3	1.5	1.5
Red Hill Avenue to Von Karman Avenue	12,332	72.1	13,200	72.4	14,700	72.9	0.8	0.5
Von Karman Avenue to Jamboree Road	14,649	72.9	16,800	73.4	18,100	73.8	0.9	0.3
Jamboree Road to Murphy Avenue	15,133	73.0	17,600	73.6	19,100	74.0	1.0	0.4
Murphy Avenue to Harvard Avenue	15,645	73.1	18,100	73.8	19,800	74.2	1.0	0.4
Harvard Avenue to Paseo Westpark	15,465	73.1	17,300	73.6	18,600	73.9	0.8	0.3
Paseo Westpark to San Marino	12,620	72.2	14,400	72.8	15,400	73.1	0.9	0.3
San Marino to Culver Drive	21,617	74.5	24,000	75.0	25,100	75.2	0.6	0.2
Barranca Parkway (Dyer)								
Pullman to Red Hill Avenue	24,454	75.1	28,000	75.7	30,500	76.0	1.0	0.4
Red Hill Avenue to Armstrong	30,266	76.0	30,300	76.0	32,000	76.2	0.2	0.2
Armstrong to Von Karman Avenue	29,815	75.9	29,800	75.9	31,300	76.1	0.2	0.2
Von Karman Avenue to Jamboree Road	22,039	74.6	22,000	74.6	23,300	74.9	0.2	0.2
Jamboree Road to Construction Circle	24,517	75.1	28,500	75.7	30,200	76.0	0.9	0.3
Construction Circle to Harvard Avenue	21,003	74.4	25,000	75.2	26,300	75.4	1.0	0.2
Harvard Avenue to Paseo Westpark	19,905	74.2	23,900	75.0	24,800	75.1	1.0	0.2
Paseo Westpark to Santa Rosa	21,004	74.4	26,400	75.4	27,400	75.6	1.2	0.2
Santa Rosa to Culver Drive	21,643	74.5	26,000	75.3	26,900	75.5	0.9	0.1
Bryan Avenue								
Jamboree Road to Marketplace	21,001	74.4	25,300	75.2	25,400	75.2	0.8	0
Marketplace to El Camino Real	17,921	73.7	23,200	74.8	23,100	74.8	1.1	0
El Camino Real to Rubicon	14,726	72.9	20,100	74.2	20,000	74.2	1.3	0
Rubicon to Culver Drive	18,343	73.8	26,300	75.4	26,400	75.4	1.6	0
Campus Drive								
MacArthur Boulevard to Martin	16,279	71.2	18,900	71.9	22,500	72.6	1.4	0.8
Martin to Von Karman Avenue	12,892	70.2	15,900	71.1	18,000	71.7	1.4	0.5
Von Karman Avenue to Teller Avenue	11,823	69.8	15,000	70.9	16,600	71.3	1.5	0.4

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Teller Avenue to Jamboree Road	10,315	69.2	13,200	70.3	14,100	70.6	1.4	0.3
Jamboree Road to Carlson Avenue	20,089	75.2	28,800	76.7	30,300	76.9	1.8	0.2
Carlson Avenue to University Drive	18,247	74.7	31,100	77.1	32,100	77.2	2.5	0.1
Carlson Avenue								
Michelson Drive to Campus Drive	3,901	68.0	5,700	69.7	6,800	70.5	2.4	0.8
Culver Drive								
I-5 NB Ramps to I-5 SB Ramps	36,738	76.8	45,200	77.7	45,300	77.8	0.9	0
I-5 SB Off-Ramp to Scottsdale Drive	49,687	78.2	57,200	78.8	57,600	78.8	0.6	0
Scottsdale Drive to Walnut Avenue	44,077	77.6	51,300	78.3	51,900	78.3	0.7	0.1
Walnut Avenue to Deerfield Avenue	42,201	77.4	48,200	78.0	48,500	78.1	0.6	0
Deerfield Avenue to Irvine Center Drive	38,904	77.1	42,600	77.5	43,100	77.5	0.4	0.1
Irvine Center Drive to Warner Avenue	41,580	77.4	46,600	77.9	47,400	78.0	0.6	0.1
Warner Avenue to Barranca Parkway	40,870	77.3	47,100	77.9	48,300	78.0	0.7	0.1
Barranca Parkway to Alton Parkway	44,253	77.7	51,300	78.3	52,900	78.4	0.8	0.1
Alton Parkway to Main Street	45,204	77.7	51,700	78.3	53,600	78.5	0.7	0.2
Main Street to San Leandro	49,711	78.2	52,700	78.4	54,300	78.5	0.4	0.1
San Leandro to I-405 NB On-Ramp	54,428	78.6	58,800	78.9	60,500	79.0	0.5	0.1
I-405 SB On-Ramp to Michelson Drive	53,319	78.5	59,400	78.9	61,700	79.1	0.6	0.2
Michelson Drive to Sandburg Way	39,658	77.2	46,600	77.9	46,800	77.9	0.7	0
Sandburg Way to University Drive	32,408	76.3	38,700	77.1	39,000	77.1	0.8	0
El Camino Real								
Jamboree Road to Alliance	20,876	73.4	24,700	74.1	24,600	74.1	0.7	0
Fairchild Road								
MacArthur Boulevard to Jamboree Road	4,393	67.6	5,500	68.6	5,800	68.8	1.2	0.2
Harvard Avenue								
Walnut Avenue to Poplar Street	9,179	70.8	11,500	71.8	11,800	71.9	1.1	0.1
Poplar Street to Deerfield Avenue	11,387	71.8	13,900	72.6	14,300	72.7	1.0	0.1
Deerfield Avenue to Irvine Center Drive	10,273	71.3	12,900	72.3	13,200	72.4	1.1	0.1

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Irvine Center Drive to Paseo Westpark	12,508	72.2	14,800	72.9	15,700	73.2	1.0	0.3
Paseo Westpark to Warner Avenue	11,065	71.6	15,400	73.1	16,100	73.3	1.6	0.2
Warner to Barranca Parkway	12,686	72.2	17,100	73.5	17,700	73.7	1.4	0.1
Barranca Parkway to San Juan	15,295	73.0	18,200	73.8	19,200	74.0	1.0	0.2
San Juan to San Leon	14,888	72.9	17,000	73.5	18,300	73.8	0.9	0.3
San Leon to Alton Parkway	16,362	73.3	18,700	73.9	20,100	74.2	0.9	0.3
Alton Parkway to San Marino	18,655	73.9	21,700	74.6	23,300	74.9	1.0	0.3
San Marino to Main Street	19,291	74.0	22,500	74.7	24,300	75.0	1.0	0.3
Main Street to Coronado	13,552	72.5	15,300	73.0	16,800	73.4	0.9	0.4
Coronado to Michelson Drive	20,167	74.2	22,900	74.8	25,100	75.2	1.0	0.4
Michelson Drive to University Drive	8,672	70.6	10,800	71.5	11,700	71.9	1.3	0.3
Irvine Center Drive								
Harvard Avenue to Hearthstone	17,848	73.7	26,900	75.5	27,000	75.5	1.8	0
Hearthstone to Culver Drive	15,815	73.2	25,500	75.3	25,700	75.3	2.1	0
Jamboree Road								
Bryan Avenue to El Camino Real	39,163	77.1	41,200	77.3	41,300	77.4	0.2	0
El Camino Real to I-5 NB On-Ramp	61,511	79.1	63,900	79.2	64,200	79.3	0.2	0
I-5 NB Ramps to I-5 SB Off-Ramp	65,707	79.4	70,200	79.7	69,700	79.6	0.3	0
I-5 SB Off-Ramp to Michelle Drive	57,976	78.8	64,300	79.3	63,300	79.2	0.4	-0.1
Michelle Drive to Walnut Avenue	54,497	78.6	59,400	78.9	61,000	79.0	0.5	0.1
Walnut Ave to Edinger Ave (& Frontage Roads)	71,936	79.8	95,600	81.0	99,300	81.2	1.4	0.2
Edinger Avenue to Warner Avenue*	78,493	80.1	83,500	80.4	87,300	80.6	0.5	0.2
Warner Avenue to Barranca Parkway	69,451	79.6	77,800	80.1	81,500	80.3	0.7	0.2
Barranca Parkway to Beckman Avenue	50,727	78.2	56,700	78.7	61,400	79.1	0.8	0.3
Beckman Avenue to Alton Parkway	49,220	78.1	54,500	78.6	59,700	79.0	0.8	0.4
Alton Parkway to McGaw Avenue	46,536	77.9	50,900	78.3	56,500	78.7	0.8	0.5
McGaw Avenue to Kelvin Avenue	45,004	77.7	49,300	78.1	55,500	78.6	0.9	0.5

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Kelvin Avenue to Main Street	53,259	78.5	57,900	78.8	67,300	79.5	1.0	0.7
Main Street to I-405 Off-Ramp	52,524	78.4	55,300	78.6	63,900	79.2	0.9	0.6
I-405 On-Ramp to Michelson Drive	69,470	79.6	74,800	79.9	90,600	80.8	1.2	0.8
Michelson Drive to Dupont Drive	51,529	78.3	56,500	78.7	65,400	79.3	1.0	0.6
Dupont Drive to Campus Drive	45,645	77.8	51,800	78.3	55,700	78.7	0.9	0.3
Campus Drive to Birch Street	40,300	77.2	46,200	77.8	51,500	78.3	1.1	0.5
Birch Street to Fairchild Road	32,438	76.3	37,800	77.0	41,700	77.4	1.1	0.4
Fairchild Road to Koll Center	33,237	76.4	37,900	77.0	42,700	77.5	1.1	0.5
Koll Center to MacArthur Boulevard	26,722	75.5	29,600	75.9	33,200	76.4	0.9	0.5
MacArthur Boulevard								
Fitch to Red Hill Avenue	35,926	76.7	38,200	77.0	43,300	77.6	0.8	0.5
Red Hill Avenue to Skypark Boulevard	15,788	73.2	16,800	73.4	18,800	73.9	0.8	0.5
Skypark Boulevard to Main Street	25,505	75.3	27,100	75.5	30,200	76.0	0.7	0.5
Main Street to I-405 NB Off-Ramp	33,677	76.5	37,300	76.9	42,000	77.4	1.0	0.5
I-405 SB On-Ramp to Michelson Drive	48,662	78.1	53,100	78.4	60,800	79.0	1.0	0.6
Michelson Drive to Douglass	40,604	77.3	45,900	77.8	50,200	78.2	0.9	0.4
Douglass to Campus Drive	33,358	76.4	38,500	77.0	39,300	77.1	0.7	0.1
Jamboree Road to Fairchild Road	30,151	76.0	37,100	76.9	38,300	77.0	1.0	0.1
Fairchild Road to University Drive	34,000	76.5	44,000	77.6	45,400	77.8	1.3	0.1
Main Street								
McDurmott to Red Hill Avenue	18,121	73.8	21,600	74.5	24,200	75.0	1.3	0.5
Red Hill Avenue to Executive Park	16,818	73.5	18,800	73.9	20,900	74.4	0.9	0.5
Executive Park to MacArthur Boulevard	26,160	75.4	28,700	75.8	31,700	76.2	0.8	0.4
MacArthur Boulevard to Mercantile	35,615	76.7	37,000	76.9	40,100	77.2	0.5	0.3
Gillette Avenue to Von Karman Avenue	17,820	73.7	18,900	74.0	21,900	74.6	0.9	0.6
Von Karman Avenue to Cartwright	16,082	73.3	17,300	73.6	19,900	74.2	0.9	0.6
Siglo to Jamboree Road	22,024	74.6	22,900	74.8	27,200	75.5	0.9	0.7
Jamboree Road to Union	19,037	74.0	19,200	74.0	21,100	74.4	0.4	0.4

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Veneto to Harvard Avenue	10,456	71.4	10,600	71.4	11,600	71.8	0.5	0.4
Harvard Avenue to San Mateo	11,382	71.8	11,500	71.8	12,500	72.2	0.4	0.4
Paseo Westpark to Culver Drive	8,757	70.6	9,000	70.7	9,600	71.0	0.4	0.3
McGaw Avenue								
Daimler Street to Red Hill Avenue	3,630	66.8	3,700	66.9	5,600	68.7	1.9	1.8
Red Hill Avenue to Von Karman Avenue	5,653	68.7	5,900	68.9	7,900	70.2	1.5	1.3
Von Karman Avenue to Jamboree Road	6,451	69.3	6,900	69.6	9,000	70.7	1.4	1.2
Jamboree Road to Murphy Avenue	2,462	65.1	2,600	65.3	5,500	68.6	**3.5**	**3.3**
Michelson Drive								
MacArthur Boulevard to Dupont Drive	14,917	71.9	15,700	72.1	19,200	73.0	1.1	0.9
Bixby to Von Karman Avenue	10,836	70.5	11,900	70.9	14,500	71.8	1.3	0.9
Von Karman Avenue to Obsidian	10,559	70.4	11,500	70.8	14,600	71.8	1.4	1.0
Teller Avenue to Jamboree Road	17,973	72.7	19,200	73.0	22,300	73.7	0.9	0.7
Jamboree Road to Carlson Avenue	14,864	71.9	17,000	72.5	23,400	73.9	2.0	1.4
Carlson Avenue to Prince	16,704	72.4	18,100	72.8	25,900	74.3	1.9	1.6
Riparian View to Harvard Avenue	16,553	72.4	17,300	72.6	22,400	73.7	1.3	1.1
Harvard Avenue to Parkside Drive	11,741	70.9	12,600	71.2	14,400	71.8	0.9	0.6
Parkside Drive to Culver Drive	16,629	72.4	17,900	72.7	20,400	73.3	0.9	0.6
Red Hill Avenue								
Dyer/Barranca Parkway to Deere Avenue	26,611	75.4	30,700	76.1	34,600	76.6	1.1	0.5
Deere Avenue to Alton Parkway	26,630	75.4	30,900	76.1	35,000	76.6	1.2	0.5
Alton Parkway to McGaw Avenue	26,216	75.4	32,900	76.4	37,800	77.0	1.6	0.6
McGaw Avenue to MacArthur Boulevard	34,187	76.5	40,500	77.3	47,100	77.9	1.4	0.7
MacArthur Boulevard to Skypark	9,780	71.1	13,000	72.3	14,900	72.9	1.8	0.6
Skypark to Main Street	12,554	72.2	17,000	73.5	19,500	74.1	1.9	0.6
University Drive								
MacArthur Boulevard to California Avenue	23,581	75.9	37,100	77.8	38,000	77.9	2.1	0.1
California Avenue to Mesa Road	32,837	77.3	43,700	78.5	45,000	78.7	1.4	0.1

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Mesa Road to Campus Drive	33,673	75.5	43,700	76.6	44,700	76.7	1.2	0.1
Campus Drive to Harvard Avenue	26,248	74.4	35,400	75.7	36,700	75.8	1.5	0.2
Harvard Avenue to San Joaquin Hills Road	21,301	75.4	33,100	77.3	33,400	77.4	2.0	0.0
San Joaquin Hills Road to Culver Drive	21,676	75.5	33,100	77.3	33,400	77.4	1.9	0.0
Von Karman Avenue								
Barranca Parkway to Alton Parkway	16,770	72.4	28,300	74.7	31,400	75.2	2.7	0.5
Alton Parkway to McGaw Avenue	16,349	72.3	21,500	73.5	24,400	74.1	1.7	0.5
McGaw Avenue to Anchor	17,271	72.6	21,200	73.5	24,100	74.0	1.4	0.6
Anchor to Main Street	17,763	72.7	21,600	73.5	24,600	74.1	1.4	0.6
Main Street to Morse Avenue	18,765	72.9	21,500	73.5	25,600	74.3	1.3	0.8
Quartz to Michelson Drive	20,193	73.2	23,600	73.9	27,900	74.6	1.4	0.7
Michelson Drive to Dupont Drive	16,840	72.5	19,500	73.1	22,600	73.7	1.3	0.6
Dupont Drive to Martin	16,346	72.3	19,200	73.0	22,400	73.7	1.4	0.7
Martin to Campus Drive	14,234	71.7	17,300	72.6	19,400	73.1	1.3	0.5
Walnut Avenue								
Myford to Jamboree SB Off-Ramp	21,169	73.4	22,000	73.6	22,200	73.7	0.2	0
Jamboree Road to Peters Canyon	18,580	72.9	23,100	73.8	23,000	73.8	0.9	0
Peters Canyon to Harvard Avenue	18,125	72.8	21,700	73.6	21,900	73.6	0.8	0
Harvard Avenue to Mall Street	16,040	72.2	19,400	73.1	19,500	73.1	0.8	0
Mall Street to Culver Drive	20,951	73.4	25,900	74.3	25,900	74.3	0.9	0
Warner Avenue								
Construction North to Harvard Avenue	8,225	69.3	14,500	71.8	14,700	71.9	2.5	0.1
Harvard Avenue to Paseo Westpark	5,766	67.8	9,300	69.9	9,300	69.9	2.1	0
Santa Ynez to Culver Drive	6,493	68.3	10,300	70.3	10,300	70.3	2.0	0
Birch Street								
Mesa Drive to Bristol Street SB	10,372	69.3	20,400	72.2	21,000	72.3	**3.1**	0.1
Bristol Street SB to Bristol Street NB	15,579	71.0	24,200	72.9	24,800	73.0	2.0	0.1
East of MacArthur Boulevard	20,327	72.2	25,800	73.2	27,000	73.4	1.2	0.2

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
West of MacArthur Boulevard	11,707	69.8	16,500	71.3	17,400	71.5	1.7	0.2
East of Von Karman Avenue	20,327	72.2	25,200	73.1	26,800	73.4	1.2	0.3
Bison Avenue								
Jamboree Road to MacArthur Boulevard	9,087	69.8	9,900	70.1	10,100	70.2	0.5	0.1
MacArthur Boulevard to SR-73	13,411	71.5	16,600	72.4	16,700	72.4	1.0	0
Bristol								
Red Hill Avenue to Campus Drive	20,119	73.2	24,300	74.0	25,600	74.3	1.0	0.2
Campus Drive to Birch Street	33,382	75.4	39,600	76.2	40,600	76.3	0.9	0.1
West of Jamboree Road	42,491	76.5	42,500	76.5	43,200	76.5	0.1	0.1
Campus Drive								
Bristol Street NB to MacArthur Boulevard	27,671	75.6	31,200	76.1	34,400	76.6	0.9	0.4
Ford Road								
Jamboree Road to MacArthur Boulevard	9,051	70.8	9,100	70.8	9,100	70.8	0	0
Irvine Avenue								
Bristol Street NB to Bristol Street SB	22,879	73.8	22,900	73.8	24,400	74.1	0.3	0.3
Bristol Street SB to Mesa Drive	24,237	74.0	21,400	73.5	24,200	74.0	0	0.5
South of University Drive	22,253	73.7	22,300	73.7	22,500	73.7	0	0
Jamboree Road								
South of MacArthur Boulevard	28,826	75.8	28,800	75.8	31,000	76.1	0.3	0.3
Bristol Street SB to Bristol Street NB	46,597	77.9	40,300	77.2	46,600	77.9	0.0	0.6
South of Bristol Street	48,897	78.1	36,000	76.8	37,400	76.9	-1.2	0.2
University Drive to Bison Avenue	42,624	77.5	35,100	76.6	36,000	76.8	-0.7	0.1
Bison Avenue to Ford Road	33,614	76.5	28,500	75.7	29,400	75.9	-0.6	0.1
MacArthur Boulevard								
Campus Drive to Birch Street	21,187	74.5	24,100	75.0	24,500	75.1	0.6	0.1
South of Birch Street	23,445	74.9	25,500	75.3	26,400	75.4	0.5	0.2
Von Karman Avenue to Jamboree Road	23,568	74.9	25,900	75.3	27,500	75.6	0.7	0.3

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
University Drive to Bison Avenue	43,429	77.6	46,400	77.9	47,100	77.9	0.4	0.1
Bison Avenue to Ford Road	75,856	80.0	78,100	80.1	78,900	80.2	0.2	0
University Drive								
East of Irvine Avenue	823	60.3	1,400	62.7	1,400	62.7	2.3	0
Jamboree Road to MacArthur Boulevard	14,628	72.8	19,200	74.0	19,300	74.0	1.2	0
Von Karman Avenue								
South of Campus Drive	10,305	71.3	11,900	71.9	13,000	72.3	1.0	0.4
South of Birch Street	11,237	71.7	12,800	72.3	14,000	72.7	1.0	0.4
Dyer Road								
Main Street to Halladay Street	25,688	75.3	30,900	76.1	32,000	76.2	1.0	0.2
Halladay Street to SR-55 SB	30,243	76.0	33,500	76.4	35,300	76.7	0.7	0.2
SR-55 SB to SR-55 NB	43,265	77.6	46,000	77.8	49,100	78.1	0.5	0.3
SR-55 NB to Pullman Street	29,458	75.9	32,100	76.3	34,500	76.6	0.7	0.3
Grand Avenue								
Warner Avenue to Hotel Terrace Drive	22,946	74.8	23,000	74.8	24,200	75.0	0.2	0.2
Hotel Terrace Drive to SR-55 NB	21,501	74.5	21,500	74.5	22,500	74.7	0.2	0.2
Halladay Street								
Dyer Road to Alton Avenue	4,687	64.6	4,900	64.8	5,400	65.3	0.6	0.4
Alton Avenue to McGaw Avenue (Columbine)	1,748	60.4	1,600	60.0	1,700	60.2	-0.1	0.3
MacArthur Boulevard								
Flower Street to Main Street	31,093	76.1	35,800	76.7	37,700	77.0	0.8	0.2
Main Street to SR-55 SB	47,010	77.9	51,000	78.3	52,800	78.4	0.5	0.2
Main Street								
Segerstrom Avenue to Alton Avenue	20,603	74.3	25,300	75.2	26,000	75.3	1.0	0.1
Alton Avenue to McGaw Avenue(Columbine)	23,743	74.9	28,500	75.7	29,500	75.9	0.9	0.1
McGaw(Columbine) to MacArthur Boulevard	28,675	75.8	29,800	75.9	30,900	76.1	0.3	0.2
MacArthur Boulevard to Sunflower Avenue	30,103	76.0	31,700	76.2	32,900	76.4	0.4	0.2

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
McGaw Avenue (Alton)								
Main Street to Halladay Street	3,092	66.1	3,900	67.1	3,900	67.1	1.0	0
Segerstrom Avenue								
Bristol Street to Flower Street	11,560	70.8	15,600	72.1	16,100	72.3	1.4	0.1
Flower Street to Main Street	18,676	72.9	23,600	73.9	24,300	74.0	1.1	0.1
Warner Avenue								
Grand Avenue to SR-55	18,190	73.8	34,500	76.6	35,600	76.7	2.9	0.1
Sunflower Avenue								
Bristol Street to Flower Street	40,204	76.2	42,000	76.4	43,700	76.6	0.4	0.2
Flower Street to Anton Boulevard	18,032	72.7	19,600	73.1	21,400	73.5	0.7	0.4
Anton Boulevard to Main Street	19,454	73.1	21,900	73.6	24,400	74.1	1.0	0.5
Browning Avenue								
Walnut Avenue to I-5	4,501	65.6	6,200	67.0	6,400	67.2	1.5	0.1
Bryan Avenue								
Newport Boulevard to Red Hill Avenue	15,300	73.0	18,800	73.9	19,000	74.0	0.9	0
Red Hill Avenue to Browning	16,200	73.3	18,600	73.9	18,700	73.9	0.6	0
Browning Avenue to Tustin Ranch Road	16,700	73.4	21,100	74.4	21,200	74.5	1.0	0
Tustin Ranch Road to Jamboree Road	16,800	73.4	21,800	74.6	21,900	74.6	1.2	0
Edinger Avenue								
West of Newport Avenue	34,312	77.5	52,300	79.3	52,800	79.4	1.9	0
Newport Avenue to Red Hill Avenue	20,215	75.2	25,900	76.3	26,300	76.3	1.1	0.1
Red Hill Avenue and Tustin Ranch Road	22,340	76.5	31,300	78.0	31,900	78.1	1.5	0.1
El Camino Real								
Newport Avenue to Red Hill Avenue	13,735	71.6	14,400	71.8	14,700	71.9	0.3	0.1
Red Hill Avenue to Browning Avenue	8,973	69.7	9,000	69.7	9,000	69.7	0	0
Browning Avenue to Tustin Ranch Road	8,392	69.4	9,800	70.1	9,900	70.1	0.7	0
Tustin Ranch Road to Jamboree Road	13,574	71.5	15,900	72.2	16,000	72.2	0.7	0

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Irvine Center Drive								
Red Hill Avenue to Jamboree Road	22,340	75.6	27,600	76.5	28,200	76.6	1.0	0.1
Jamboree Road to Harvard Avenue	13,952	73.6	18,500	74.8	18,800	74.9	1.3	0.1
Mitchell Avenue								
Newport Avenue to Red Hill Avenue	7,350	66.6	8,200	67.1	8,000	67.0	0.4	-0.1
Red Hill Avenue to Browning Avenue	4,417	64.4	5,800	65.6	5,700	65.5	1.1	-0.1
Newport Avenue								
El Camino Real to I-5	28,516	72.5	37,000	73.6	37,500	73.7	1.2	0.1
I-5 to Mitchell Avenue	31,417	72.9	40,100	74.0	40,600	74.0	1.1	0.1
Mitchell Avenue to McFadden Avenue	29,223	72.6	39,100	73.9	39,900	73.9	1.4	0.1
North of Sycamore Avenue	9,604	67.8	22,800	71.5	23,400	71.6	**3.9**	0.1
Valencia Avenue to Edinger Avenue	18,205	70.5	34,600	73.3	35,300	73.4	2.9	0.1
Nisson Road								
Newport Avenue to Red Hill Avenue	5,593	65.4	6,000	65.7	6,000	65.7	0.3	0
Red Hill Avenue to Browning Avenue	3,915	63.9	5,200	65.1	5,200	65.1	1.2	0
Red Hill Avenue								
I-5 NB Ramps to El Camino Real	43,222	74.3	43,200	74.3	43,200	74.3	0	0
I-5 SB Ramps to I-5 NB Ramps	38,996	73.8	39,000	73.8	39,000	73.8	0	0
Nisson Road to I-5 SB	38,235	73.8	38,200	73.8	38,200	73.8	0	0
Nisson Road to Mitchell Avenue	26,681	72.2	26,700	72.2	26,700	72.2	0	0
Mitchell Avenue to Walnut Avenue	25,830	72.1	26,000	72.1	26,500	72.2	0.1	0.1
Walnut Avenue to Sycamore Avenue	27,502	73.5	27,500	73.5	27,500	73.5	0	0
Sycamore Avenue to Edinger Avenue	29,957	73.9	30,000	73.9	30,000	73.9	0	0
Edinger Avenue to Valencia Avenue	25,507	73.2	28,300	73.6	29,000	73.7	0.6	0.1
Valencia Avenue to Warner Avenue	26,723	75.5	31,600	76.2	33,400	76.4	1.0	0.2
Warner Avenue to Barranca Parkway/Dyer	29,570	75.9	31,800	76.2	34,400	76.6	0.7	0.3

Table 5.9-11
Post-Year 2030 Traffic Noise Levels
(dBA CNEL)

Segment	Existing Year 2008		Post-Year 2030 Without Project		Post-Year 2030 With Project		Increase in dBA	
	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	ADT Volumes	CNEL (dBA @ 50 ft)	From Existing	Due to the Project
Sycamore Avenue								
SR-55 NB to Newport Avenue	9,036	67.5	7,400	66.6	7,500	66.7	-0.8	0.1
Newport Avenue to Red Hill Avenue	7,758	66.8	8,400	67.2	8,500	67.2	0.4	0.1
Tustin Ranch Road								
North of I-5	32,560	76.3	38,500	77.0	38,300	77.0	0.7	0
I-5 to Walnut Avenue	21,087	74.4	36,600	76.8	36,900	76.9	2.4	0
Valencia Avenue								
Newport Avenue to Red Hill Avenue	3,690	65.9	15,900	72.2	16,500	72.4	**6.5**	0.2
Walnut Avenue								
East of Newport Avenue	15,375	72.1	20,800	73.4	21,000	73.4	1.4	0
East of Red Hill Avenue	15,579	72.1	17,400	72.6	17,500	72.6	0.5	0
West of Tustin Ranch Road	19,862	73.2	22,500	73.7	22,700	73.7	0.6	0
Franklin Avenue to Myford Road	18,249	72.8	21,000	73.4	21,200	73.5	0.7	0
Warner Avenue								
SR-55 to Red Hill Avenue	13,682	72.6	34,300	76.5	35,900	76.7	**4.2**	0.2

Source: FHWA Traffic Noise Prediction Model. Based on traffic volumes obtained from the traffic analysis prepared by Parson Brinkerhoff (December 2009) and speed limits obtained from Google Maps.
NB: northbound; SB: southbound; EB: eastbound; WB: westbound

Traffic noise increases that are 3 dBA when noise levels are above 65 dBA are in **bold** in the tables below. Under the 2015 scenarios (interim year), maximum noise-level increases on local roadways due to the project would be minimal, 1.3 dBA CNEL or less. Increases in traffic levels solely from traffic volumes generated by the project would not result in a substantial noise increase along roadways in the project vicinity at year 2015. However, at full buildout, post-2030 traffic volumes would generate up to 3.3 dBA CNEL. Because the traffic growth in the IBC would generate traffic volumes on this roadway segment that would noticeably increase ambient noise levels, traffic noise impacts are considered significant for segments adjacent to noise-sensitive land uses.

Subsequent Development Pursuant to the Proposed Project

Traffic generated by the pending projects would contribute to the increases in traffic noise levels identified in Tables 5.9-10 and 5.9-11. Consequently, impacts associated with the individual development projects, Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin would not differ significantly from the IBC Vision Plan. Impacts are significant.

IMPACT 5.9-4: STATIONARY-SOURCE NOISE GENERATED BY LAND USES WITHIN THE IBC WOULD COMPLY WITH THE CITY OF IRVINE MUNICIPAL CODE AND WOULD NOT SUBSTANTIALLY ELEVATE THE AMBIENT NOISE ENVIRONMENT. [THRESHOLD N-1 AND N-3]

Impact Analysis: Stationary-source noise is regulated by the City of Irvine through the City's Municipal Code. Buildout of the IBC would result in an increase in residential and commercial development in the City. The primary noise sources from these land uses include landscaping, maintenance activities, and air conditioning systems. In addition, future commercial uses may include loading docks. In general, residential or commercial uses are not substantial sources of noise because the ambient noise environment is dominated by roadway noise.

HVAC Systems and Use of Other Mechanical Equipment

The City of Irvine requires that noise from new stationary sources within the City comply with the City's Noise Ordinance, which limits the acceptable noise at the property line of the impacted use, to reduce nuisances to sensitive land uses. To achieve the noise standards of the Municipal Code, HVAC systems and other equipment would be selected based on their noise rating or would be acoustically engineered with mufflers and barriers to ensure that no exceedance of the City's noise standards would occur. Maintenance activities and use of leaf blowers are restricted to the least noise-sensitive portions of the day. Consequently, stationary-source noise from these types of proposed land uses would not substantially increase the noise environment.

Parking Lot Noise

The parking lots associated with the new high-density residential development would generate noise. Typical parking lot noises would be car-door slams, car horns, car audio systems, people talking, engine idling, and car beeps. However, in order to accommodate the growth associated with buildout of the IBC, the majority of parking spaces for the new residential structures would be in subterranean parking garages or in structures surrounded by residential units. The building structure would serve as a barrier and attenuate noise from the majority of parking lot activities. Consequently, noise from the parking area would not be substantial and no significant impacts would occur.

Truck Idling and Deliveries

Noise from truck loading/unloading activities would be primarily from the warning back-up bells and truck engine noise when backing up to the truck bays of the retail and commercial buildings. Noise levels from actual unloading and loading activities would be minimal, as the truck interior would be shielded from the exterior environment and unloading and loading activities would occur in the interior of the building after the truck is docked. Commercial deliveries or pick-ups for commercial properties that share a property line with any residential property are required to limit the hours of delivery/pick-up service to the hours of 7:00 AM to 10:00 PM daily. Moreover, commercial trucks are also prohibited from idling more than five minutes under the California Air Resources Board's In-Use Idling Airborne Toxic Control Measure. Consequently, impacts from these activities would be less than significant.

Subsequent Development Pursuant to the Proposed Project

Impacts associated with the individual development projects—Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin—would not differ significantly from the IBC Vision Plan. Impacts are less than significant.

IMPACT 5.9-5 SENSITIVE LAND USES COULD BE EXPOSED TO NOISE LEVELS THAT EXCEED 65 dBA CNEL FROM TRANSPORTATION OR STATIONARY SOURCES. [THRESHOLDS N-1 AND N-3]

Impact Analysis: An impact could be significant if the new residential developments are in areas that exceed the noise compatibility criteria of the City. The City applies the state's Community Noise and Land Use Compatibility standards, summarized in Table 5.9-3, for the purpose of assessing the compatibility of new development with existing noise sources, such as vehicles or loud stationary sources. It is the policy of the City of Irvine to require new noise-sensitive residential developments to achieve an exterior noise environment of 65 dBA CNEL. Commercial and industrial areas are not considered noise sensitive and have much higher tolerances for exterior noise levels.

In addition to the exterior noise compatibility standards, the City requires that buildings be constructed to achieve interior noise standards. The building interior of noise-sensitive structures is required to achieve noise levels of 45 dBA CNEL under the California Building Code and Title 21 of the California Code of Regulations for noise-sensitive structures within the 65 dBA CNEL contour of an airport (see Impact 5.9-6). While interior areas can be mitigated to achieve acceptable interior noise levels, it may not be possible to achieve the noise compatibility criteria for noise-sensitive exterior areas.

Exterior Noise Compatibility

The exact locations of residential developments and active recreational areas have not yet been determined and therefore specific impacts cannot be ascertained. However, roadways would generate noise levels above 65 dBA CNEL in the vicinity of the proposed project area. In addition, because many of the existing uses in the IBC are commercial and industrial, placement of a noise-sensitive development in the vicinity of existing sources of stationary noise (e.g., warehousing truck distribution centers, emergency generators, and other sources of mechanical or truck idling noise) may be potentially significant. Any siting of new noise-sensitive land uses (e.g., residential or noise-sensitive outdoor areas, such as tot-lots, swimming pools, or athletic fields) within a noise environment that exceeds the normally acceptable land use compatibility criterion creates 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.

PPP 9-2 requires that an acoustic study be prepared to achieve the City of Irvine's exterior noise standards. While interior noise levels are required to achieve the interior noise limits of 45 dBA CNEL for residential structures and 55 dBA CNEL for commercial structures, exterior noise levels at noise-sensitive land uses (e.g., residential or noise-sensitive outdoor areas such as tot-lots, swimming pools, or athletic fields) may continue to exceed the 65 dBA CNEL noise compatibility criterion for the City despite exterior noise attenuation (i.e., walls and/or berms). PDF 9-3 requires that occupancy disclosure notices are provided to tenants for units with patios and/or balconies that do not meet the 65 dBA CNEL. Because noise-sensitive land uses could be exposed to noise levels that exceed 65 dBA CNEL, impacts would be potentially significant.

Interior Noise Levels

Pursuant to the California Building Code, noise-sensitive habitable rooms would be required to be designed to achieve an interior noise standard of 45 dBA CNEL. In general, exterior-to-interior transmission loss from standard building construction results in a minimum attenuation of 24 dBA (SAE 1971). While the exact locations of the noise-sensitive structures have not yet been determined, building facades within the 70 dBA CNEL noise contour would require architectural improvements, such as Sound Transmission Class (STC)-rated windows and doors, to achieve the required 45 dBA CNEL interior noise level limits. Because noise levels along major arterials could exceed these limits, noise-sensitive land uses could require additional insulation to meet the 45 dBA CNEL standard and impacts are potentially significant. However, PPP 9-2 requires that an acoustic study be prepared to achieve the City of Irvine's interior noise standards to ensure no significant impacts would occur.

Subsequent Development Pursuant to the Proposed Project

New residential developments would be required to achieve the 45 dBA CNEL interior noise standard. Consequently, impacts associated with the individual development projects—Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin—would be less than significant with adherence to PPP 9-2 and PDF 9-4.

IMPACT 5.9-6: NOISE-SENSITIVE HABITABLE ROOMS IN STRUCTURES WITHIN THE 60 dBA CNEL NOISE CONTOUR OF THE JOHN WAYNE AIRPORT WOULD BE EXPOSED TO SUBSTANTIAL LEVELS OF AIRPORT-RELATED NOISE. [THRESHOLDS N-5]

Impact Analysis: Aircraft overflights, takeoffs, and landings associated with operations of the John Wayne Airport contribute to the ambient noise environment. Each of these events exposes sensitive receptors near the airport to elevated noise levels.

John Wayne Airport

The City of Irvine considers residential uses in the vicinity of the JWA to be normally acceptable within the airport noise environment so long as they do not extend into the 65 dBA CNEL noise contour. Title 21 of the California Code of Regulations requires that adequate acoustical insulation be provided for noise-sensitive uses within the 65 dBA CNEL noise contour to ensure that interior noise levels achieve 45 dBA CNEL. In addition, the City of Irvine has a supplemental criteria for single-event noise that also requires homes within the 60 dBA noise contour of the JWA to be constructed to mitigate the loudest 10 percent of aircraft noise events (single-event noise). This criteria is in addition to the interior noise standard of 45 dBA CNEL under Title 21 and Title 24 of the California Building Code. Since the loudest noise associated with aircraft is essentially the same during the day or evening, homes must be constructed to comply with the more stringent 55 dBA $L_{max}(10)$ criteria. The single-event noise standard is typically more

restrictive than the 24-hour noise standard since it requires interior noise levels to achieve standards based on the loudest aircrafts taking off and landing from JWA rather than average 24-hour noise levels.

Sensitive areas in an airport noise environment that exceeds 65 dBA CNEL would be required to conduct a noise assessment and mitigate, as feasible, to achieve an exterior noise environment of 65 dBA CNEL. However, because much of the noise from the airport is overhead, walls, berms, and other intervening structures would do little to reduce noise from aircraft operations. Consequently, designation of any noise-sensitive land use (e.g., residential) within the 65 dBA CNEL noise contour of the John Wayne Airport would be considered significant.

Figure 5.9-2, *Projected John Wayne Airport Noise -Impact Zones,* shows noise-impacted areas within the IBC based on the projected increase in airport operations, as defined by the AELUP for the JWA. As shown in this figure, portions of the IBC are within the 60 and 65 dBA CNEL aircraft operation noise contours identified in the AELUP for John Wayne Airport. The most recent projected noise impact zones were adopted by the Airport Land Use Commission in April 2008. Within the 65 dBA CNEL noise contour, Noise Impact Zone 1, the AELUP defines the noise exposure to be High Noise Impact. Per the AELUP for JWA, the noise impact in this zone is sufficient to warrant restrictions on residential uses and to require sound attenuation measures on other uses. AELUP defines the noise exposure to be Moderate Noise Impact within the 60 dBA CNEL noise contour, Noise Impact Zone 2. Per the AELUP for JWA, noise impacts in this area are sufficient to require sound attenuation. Single-noise events in this area create serious disturbances for many inhabitants. AELUP notes that residents occupying residential units within Noise Impact Zone 2 may experience "inconvenience, annoyance, or discomfort arising from noise of aircraft at the airport." As outlined in the AELUP and Title 21, the residential use interior sound attenuation requirement within this noise impact zone is required to be a CNEL value not exceeding an interior level of 45 dB.

Under the proposed project, development of residential and noise-sensitive recreational uses would be limited to the Multi Use and Urban Neighborhood Districts. As shown in Figure 5.9-2, the Multi-Use and Urban Neighborhood Districts would not fall within the 65 dBA CNEL noise contour for the JWA. However, portions of these districts would fall within the 60 dBA CNEL noise contour for the airport. Residents and other noise-sensitive receptors (e.g., parks) located within the 60 dBA CNEL noise contour would not be exposed to excessive exterior noise levels from operations of the John Wayne Airport because exterior noise levels would not exceed 65 dBA CNEL, which is the City's land use compatibility criteria.

However, indoor habitable areas could potentially be exposed to excessive noise levels causing sleep disturbance from single-event aircraft overflights (i.e., the City's 55 dBA $L_{max}(10)$ criterion). Consequently, indoor and exterior environments would be exposed to elevated noise levels from aircraft overflights.

Interior noise levels are required to achieve the interior noise limits of 45 dBA CNEL and 55 dBA $L_{max}(10)$ for residential structures (PDF 9-4 and PPP 9-2) and 55 dBA CNEL (PPP 9-2) for commercial structures. No noise-sensitive residential developments would be located within the 65 dBA CNEL contour of the airport. Consequently, with PDF 9-4 and PPP 9-2, noise generated by aircraft overflights would not generate noise levels that exceed 45 dBA CNEL in habitable rooms and impacts would be less than significant.

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Subsequent Development Pursuant to the Proposed Project

Pending projects are not located within the 65 dBA CNEL noise contour of the JWA. Furthermore, residential development projects within the 60 dBA CNEL noise contour would be required to achieve both interior noise levels of 45 dBA CNEL in accordance with Title 24 and Title 21 of the California Building Code and the City's 55 dBA L_{max}(10) criterion. Consequently, impacts associated with the individual development projects—Martin Street Condos, 2851 Alton, Avalon Jamboree II, Irvine Technology Center, Kilroy, Alton/Millikan Apartments, and 2852 Kelvin—would be less than significant.

5.9.4 Cumulative Impacts

Mobile-Source Noise

Traffic noise increases on local roadways in the vicinity of the project site were shown in Tables 5.9-10 and 5.9-11. The increase in traffic noise from the existing noise environment for year 2015 and post-2030 scenarios is cumulative noise increases, whereas the increase from the 2015 or 2030 baseline is the project's contribution to cumulative noise increases. Project-related cumulative noise impacts may occur if the project contributes (0.1 dBA or more) to substantial (3 dBA or more) cumulative noise increases. Roadway segments where substantial (+ 3 dBA) cumulative increases were identified are **bold** in the tables. As shown in these tables, the project would cumulatively contribute to substantial increases on the following roadway segments:

- Valencia Avenue between Newport Avenue and Red Hill Avenue (2015 and 2030)
- Warner Avenue between State Route 55 (SR-55) and Red Hill Avenue (2015 and 2030)
- McGaw Avenue between Jamboree Road and Murphy Avenue (2030)
- Birch Street between Mesa Drive and Bristol Street (2030)

Stationary-Source Noise

Unlike transportation noise, whose effects can extend well beyond the limits of the project site, stationary-source noise generated by the project is limited to impacts to sensitive receptors adjacent to the project site. However, no significant impacts were identified, as stationary-source noise is regulated by the City of Irvine through the City's Municipal Code. Furthermore, stationary sources are not substantial sources of ambient noise because the predominant noise source in the IBC is traffic on major roadways. Consequently, the project would not cumulatively contribute to stationary-source noise impacts.

Construction Noise and Vibration

Like stationary-source noise, cumulative construction noise and vibration impacts are confined to a localized area. Consequently, cumulative impacts would only occur if other projects are being constructed in the vicinity of the project at the same time as the project. Consequently, project-related construction noise and vibration added to construction noise and vibration from nearby development activities would substantially increase the ambient noise environment or generate perceptible levels of vibration. Cumulative impacts are therefore also considered significant.

5.9.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.9-4 and 5.9-6.

Impact 5.-4

The City of Irvine regulates stationary source noise through the City's Municipal. Stationary-source noise from HVAC systems, mechanical noise, parking lot noise, truck idling, and deliveries would not substantially increase the noise environment.

Impact 5.9-6

Interior noise levels are required to achieve the interior noise limits of 45 dBA CNEL and 55 dBA L_{max}(10) for residential structures (PDF 9-4 and PPP 9-2) and 55 dBA CNEL (PPP 9-2) for commercial structures. No noise-sensitive residential developments would be located within the 65 dBA CNEL contour of the airport. Consequently, with PDF 9-4 and PPP 9-2, noise generated by aircraft overflights would not generate noise levels that exceed 45 dBA CNEL in habitable rooms and impacts would be less than significant.

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

- Impact 5.9-1 Construction activities could result in temporary noise increases in the vicinity of the proposed project.
- Impact 5.9-2 Construction of the proposed project may generate perceptible levels of vibration at adjacent vibration-sensitive land uses.
- Impact 5.9-3 Project-related vehicle trips would substantially increase ambient noise at noise-sensitive receptors in the vicinity of the project site on McGaw Avenue between Jamboree Road and Murphy Avenue and cumulatively on Valencia Avenue between Newport Avenue and Red Hill Avenue, Warner Avenue between SR-55 and Red Hill Avenue, McGaw Avenue between Jamboree Road and Murphy Avenue, Birch Street between Mesa Drive and Bristol Street.
- Impact 5.9-5 Noise-sensitive land uses could be exposed to noise levels that exceed 65 dBA CNEL from transportation noise.

5.9.6 Mitigation Measures

Impact 5.9-1

No feasible mitigation measures are available.

Impact 5.9-2

No feasible mitigation measures are available.

Impact 5.9-3

No mitigation measures are available to reduce impacts associated with a substantial increase in traffic noise generated by project-related traffic and the project's contribution to cumulative growth in traffic levels. However, when new noise-sensitive residential developments are integrated into the IBC (Impact 5.9-5) they would be constructed to achieve the California Building Code interior noise standards (see PPP 9-2).

Impact 5.9-5

No feasible mitigation measures are available.

5.9.7 Level of Significance After Mitigation

Impact 5.9-1

PPP 9-1 and PDF 9-2 would minimize noise from construction activities to the extent feasible by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and that stationary source equipment be placed as far as feasible from adjacent noise-sensitive land uses. However, because new development may occur near noise-sensitive land uses and could generate substantial noise levels for an extended period of time, impacts are considered potentially significant. The magnitude of impact would depend of the location and schedule of the new development and construction equipment. Impact 5.9-1 would remain **Significant and Unavoidable**.

Impact 5.9-2

PPP 9-1 and PDF 9-2 would minimize impacts associated with perceptible levels of vibration annoyance by requiring that activities be limited to the hours set forth in the City of Irvine Municipal Code and stationary-source equipment be placed as far as feasible from adjacent vibration-sensitive land uses. In addition, PDF 9-1 would ensure that less vibration-intensive equipment or construction techniques be used. However, because new development may occur near noise-sensitive land uses and could generate substantial vibration levels for an extended period of time, impacts are considered potentially significant. The magnitude of impact would depend of the location of the new development and construction equipment. Impact 5.9-2 would remain **Significant and Unavoidable**.

Impact 5.9-3

No feasible mitigation measures are available to reduce impacts associated with a substantial increase in traffic noise generated by project-related traffic and the project's contribution to cumulative noise impacts associated with increases in traffic levels. Consequently, Impact 5.9-3 and cumulative impacts would remain **Significant and Unavoidable**.

Impact 5.9-5

PPP 9-2 would require that an acoustic study be prepared to achieve the City of Irvine's interior and exterior noise standards. While interior noise levels are required to achieve the interior noise limits of 45 dBA CNEL for residential structures and 55 dBA CNEL for commercial structures, exterior noise levels may continue to exceed the 65 dBA CNEL noise compatibility criteria for the City despite exterior noise attenuation (i.e., walls and/or berms). PDF 9-3 would require that occupancy disclosure notices are provided to all future tenants for units with patios and/or balconies that do not meet the 65 dBA CNEL.

However, exterior noise compatibility would be significant at noise sensitive outdoor area (e.g., residential patios and outdoor areas, such as tot-lots, swimming pools, or athletic fields). No feasible mitigation measures are available to reduce impacts associated with a substantial increase in traffic noise generated by project-related traffic and the project's contribution to cumulative noise impacts associated with increases in traffic levels. Consequently, Impact 5.9-5 would remain **Significant and Unavoidable**.