Section 5.6:

Noise

SECTION 5.6
NOISE

5.6.1 PURPOSE

The purpose of this section is to summarize the existing noise conditions within the City of Fullerton. Information in this section was obtained from the *City of Fullerton Municipal Code* (Municipal Code). For the purposes of mobile source noise modeling and contour distribution, traffic information contained in the *Transportation and Circulation Existing and Build-out Conditions Report* (Traffic Impact Analysis), July 2011, prepared by Kimley-Horn and Associates, Inc. was utilized; refer to Appendix C, Traffic Impact Analysis. Appendix E, Noise Data, includes data to support this analysis in this section.

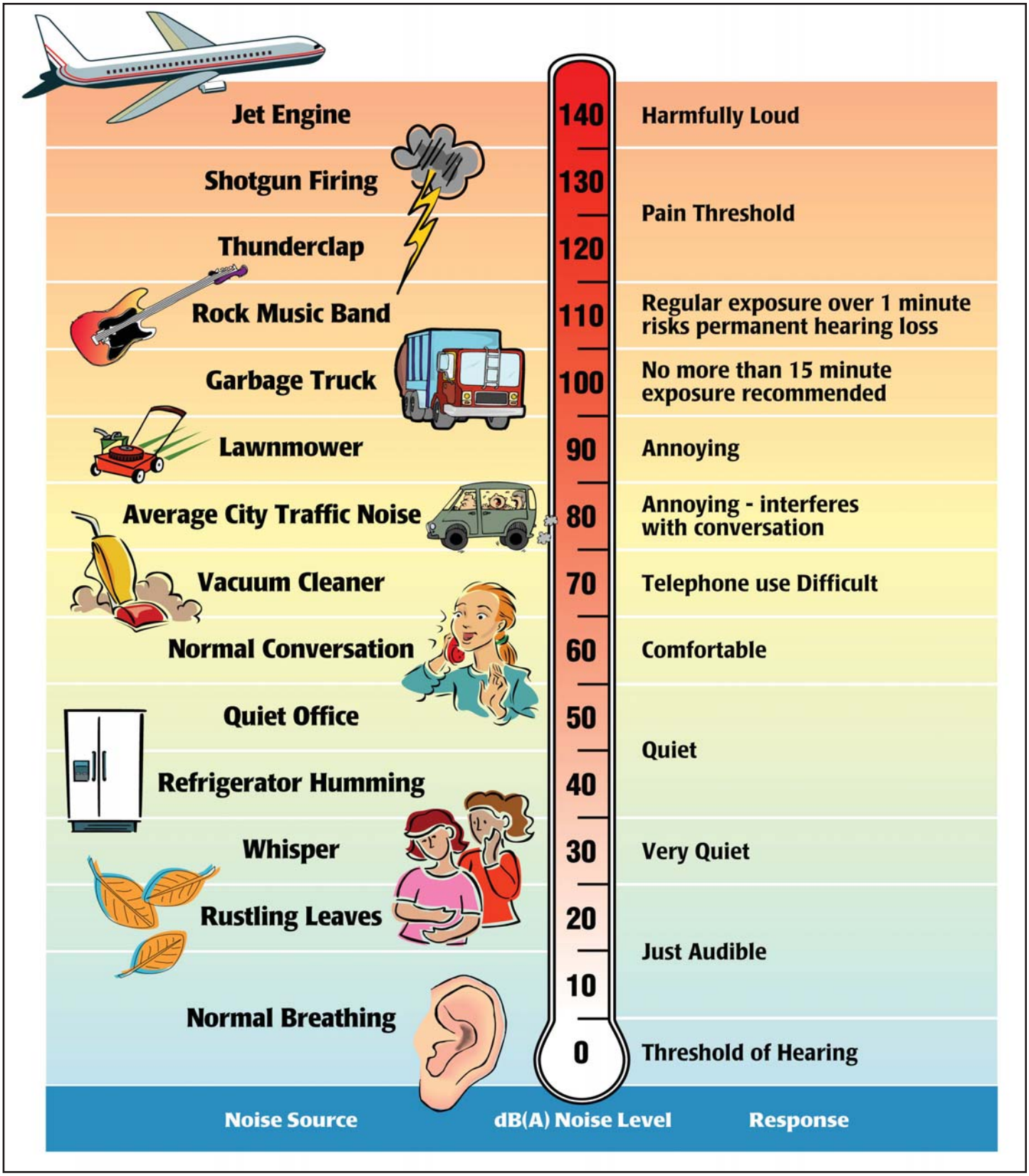
5.6.2 EXISTING REGULATORY SETTING

Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and should be approximated by the A-weighted sound levels (expressed as dBA) and the way the human ear perceives noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

Community noise is commonly described in terms of the “ambient” nose level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud and 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are illustrated on Exhibit 5.6-1, *Sound Levels and Human Response*.



Source: Melville C. Branch and R. Dale Beland, *Outdoor Noise in the Metropolitan Environment*, 1970.
Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA/ONAC 550/9-74-004), March 1974.

Sound Levels and Human Response

Exhibit 5.6-1

Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Numerous methods have been developed to measure sound over a period of time; refer to Table 5.6-1, *Noise Descriptors*.

Table 5.6-1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the L_{eq}'s for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM), by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.

Source: Cyril M. Harris, *Handbook of Noise Control*, dated 1979.

It is difficult to specify noise levels that are generally acceptable to everyone; what is annoying to one person may be unnoticed by another. Standards may be based on documented complaints in response to documented noise levels, or based on studies of the ability of people to sleep, talk, or work under various noise conditions. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, Federal and State agencies provide standards and guidelines to the local jurisdictions.

FEDERAL

The Federal Noise Control Act of 1972 established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, the U.S. Environmental Protection Agency (EPA) administrators determined that subjective issues such as noise would be better addressed at more local levels of government, thereby allowing more individualized control for specific issues by designated Federal, State, and local government agencies. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to specific federal agencies, and state and local governments. However, noise control guidelines and regulations contained in the U.S. EPA rulings in prior years remain in place.

STATE

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles (i.e., the *California Vehicle Code*) and those governing occupational noise control (i.e., Occupational Safety and Health Administration) are not applicable to planning efforts nor are these areas typically subject to CEQA analysis. Thus, these regulatory guidelines are not included in this analysis. The following is State of California and state agency regulation that has been deemed applicable to this project.

Title 24

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for residential buildings (*CCR Title 24*, Part 2, Chapter 12, Section 1207.11.2). *Title 24* establishes standards for interior room noise attributable to outside noise sources. *Title 24* also specifies that acoustical studies should be prepared whenever a residential building or structure is proposed to be located in areas with exterior noise levels 60 dB Ldn or greater. The acoustical analysis must show that the building has been designed to limit intruding noise to an interior level not exceeding 45 dB Ldn for any habitable room.

Governor's Office of Planning and Research

The State of California General Plan Guidelines, published by the State Governor's Office of Planning and Research (OPR), provides guidance for the acceptability of specific land use types within areas of specific noise exposure. Table 5.6-2, *Land Use Compatibility for Community Noise Environments*, presents guidelines for determining acceptable and unacceptable

community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. OPR guidelines are advisory in nature. Local jurisdictions, including the City of Fullerton, have the responsibility to set specific noise standards based on local conditions.

Table 5.6-2
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 - 70	70 – 75	75 – 85
Residential – Multiple Family	50 – 65	60 – 70	70 – 75	70 – 85
Transient Lodging – Motel, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	NA	65 – 85
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	NA	70 – 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 77.5	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 – 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 – 77.5	75 – 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	75 – 85	NA
CNEL = community noise equivalent level; NA = not applicable				
NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice. NORMALLY UNACCEPTABLE: New construction or development should 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 must be included in the design. CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.				
Source: Office of Planning and Research, California, *General Plan Guidelines,* October 2003.				

As depicted in Table 5.6-2, the range of noise exposure levels overlap between the normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable categories. The OPR's *State of California General Plan Guidelines*, note that noise planning policy needs to be rather flexible and dynamic to reflect not only technological advances in noise control, but also economic constraints governing application of noise-control technology and anticipated regional growth and demands of the community. In project specific analyses, each community must decide the level of noise exposure its residents are willing to tolerate within a limited range of values below the known levels of health impairment. Therefore, the City may use their discretion to determine which noise levels are considered acceptable or unacceptable, based on land use, project location, and other project factors.

LOCAL JURISDICTION

City of Fullerton Noise Standards

CITY OF FULLERTON GENERAL PLAN (THE FULLERTON PLAN)

The State of California has mandated that local governments prepare a noise element as part of their general plans. The Community Health and Safety Element of the City's *General Plan* (Fullerton Plan) is contains noise guidelines in Section 2.6 (Noise). The Community Health and Safety Element is the guiding document for the City's noise policy and contains various goals with accompanying policies designed to protect residents and businesses from excessive and persistent noise intrusions. Section 2.6 of the Community Health and Safety Element describes the existing noise environment, goals and policies, as well as Federal, State and City noise regulations.

CITY OF FULLERTON MUNICIPAL CODE

The City of Fullerton's regulations with respect to noise are included in Chapter 15.90 (Noise Standards and Regulation) of the Municipal Code, also known as the Noise Ordinance. Construction-related and operational noise restrictions are discussed below.

Section 15.90.010 of the Noise Ordinance sets forth the general prohibition:

A. In order to control unnecessary, excessive and annoying sounds emanating from incorporated areas of the city, it shall be the policy of the city to prohibit such sounds generated from all sources as specified in this chapter except that noise regulated by any penal statute or ordinance and those activities that have been preempted by state or federal law.

B. Specified noise levels have been determined to be detrimental to the public health, welfare and safety and contrary to public interest; therefore, creating, maintaining, causing or allowing to create, maintain or cause any noise in a manner prohibited by or not in conformity with the provisions of this chapter is a public nuisance and shall be punishable as such. (Ord. 2982, 2001).

Section 15.90.030 (A) defines the interior and exterior noise level limits for residential land uses; refer to Table 5.6-3, *City of Fullerton Sound Level Limits*. The City does not have specific noise level limits for commercial or industrial zones.

Section 15.90.030 B. further defines the applicability of the noise level limits for a sensitive use. Section 15.90.030 B. defines a sensitive use as private or public school, hospital, residential care facility for the elderly, and religious institution. According to Section 15.90.030 B., it is unlawful for any person within the incorporated area of the city to create any noise that causes the noise level at any sensitive use to exceed the noise limits as specified for the Residential Noise Zone, notwithstanding the sensitive use may be located outside of the Residential Noise Zone.

Table 5.6-3
City of Fullerton Sound Level Limits

Residential Zones	Sound Level Limits dBA Leq – 1-hour average	
	7:00 a.m. to 10:00 p.m. (day and evening)	10:00 p.m. to 7:00 a.m. (night)
Interior Noise Levels Limits	55	45
Exterior Noise Level Limits	55	50

Source: City of Fullerton, City of Fullerton Municipal Code Section 15.90.030 (A), May 2009.

Section 15.90.030 C. identifies how the sound level limits identified in Section 15.90.030 A., Table 5.6-3 above, will be enforced. Section 15.90.030 C. states "It shall be unlawful for any person at any location within the incorporated area of the city to create any noise which can be classified as being continuous, reoccurring, predictable, or whose operation of noise-generating capability can be stopped or started at a specified time, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level, when measured on the property, either incorporated or unincorporated, to exceed:

1. The noise standard for a cumulative period of more than 30 minutes in any hour;
2. The noise standard plus 5 dBA for a cumulative period of more than 15 minutes but less than 30 minutes in any hour;
3. The noise standard plus 10 dBA for a cumulative period of more than 5 minutes but less than 15 minutes in any hour;
4. The noise standard plus 15 dBA for a cumulative period of more than one minute but less than five minutes in any hour; and
5. The noise standard plus 20 dBA for a cumulative period of less than one minute in an hour."

Section 15.90.030 D. states that "in the event the ambient noise level exceeds any of the five noise limit categories listed in Subsection C, the cumulative period applicable to the category shall be increased to reflect the ambient noise level." (Ord. 2982, 2001)

Construction Noise

Section 15.90.050, activities with special provisions, is the relevant ordinance controlling construction noise. Subsection A states, "the following activities shall be exempt from the noise level standards specified by this chapter provided they take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except Sunday or a City-recognized holiday.

- Noise sources associated with construction, repair, remodeling, or grading of any real property;
- Mobile noise sources associated with agricultural operations; and
- Noise sources associated with the maintenance of real property, including normal maintenance and repair by city and utility crews."

Chapter 15.90 does not set specific noise level limits on construction related activity.

Vibration

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the soil mass. These energy waves generally dissipate with distance from the vibration source as a result of spreading of the energy and frictional losses. The energy transmitted through the ground as vibration, if great enough, can result in structural damage. To assess the potential for structural damage associated with vibration from construction activities, the vibratory ground motion in the vicinity of an affected structure is measured in terms of peak particle velocity (PPV), typically in units of inches/second.

5.6.3 EXISTING ENVIRONMENTAL SETTING

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise generally increases with the environmental sound level. However, many factors also influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses will range from "not annoyed" to "highly annoyed."

When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible, and as the noise level rises, dissatisfaction among the public steadily increases. However, an individual's reaction to a particular noise depends on many factors, such as the source of the sound, its loudness relative to the background noise, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

1. Noise-Induced Hearing Loss
2. Interference with Communication
3. Effects of Noise on Sleep
4. Effects on Performance and Behavior
5. Extra-Auditory Health Effects
6. Annoyance

Noise-Induced Hearing Loss. Although it often causes discomfort and sometimes pain, noise-induced hearing loss usually takes years to develop. Noise-induced hearing loss can impair the quality of life through a reduction in the ability to hear important sounds and to communicate with family and friends. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. While the loss may be temporary at first, it could become

permanent after continued exposure. When combined with hearing loss associated with aging, the amount of hearing loss directly caused by the environment is difficult to quantify. Although the major cause of noise-induced hearing loss is occupational, substantial damage can be caused by non-occupational sources. According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure.

Interference with Communication. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise. Interference with communication has proved to be one of the most important components of noise-related annoyance.

Effects of Noise on Sleep. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Effects on Performance and Behavior. Recent research indicates that more moderate noise levels can produce disruptive after-effects, commonly manifested as a reduced tolerance for frustration, increased anxiety, decreased incidence of "helping" behavior, and increased incidence of "hostile" behavior.

Extra-Auditory Health Effects. Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. Most effects seem to be transitory, but with continued exposure some effects have been shown to be chronic in laboratory animals.

Annoyance. Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one's peace of mind and the enjoyment of one's environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the effects of annoyance to the community were quantified. In areas where noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA CNEL, that percentage rises to 15

percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.

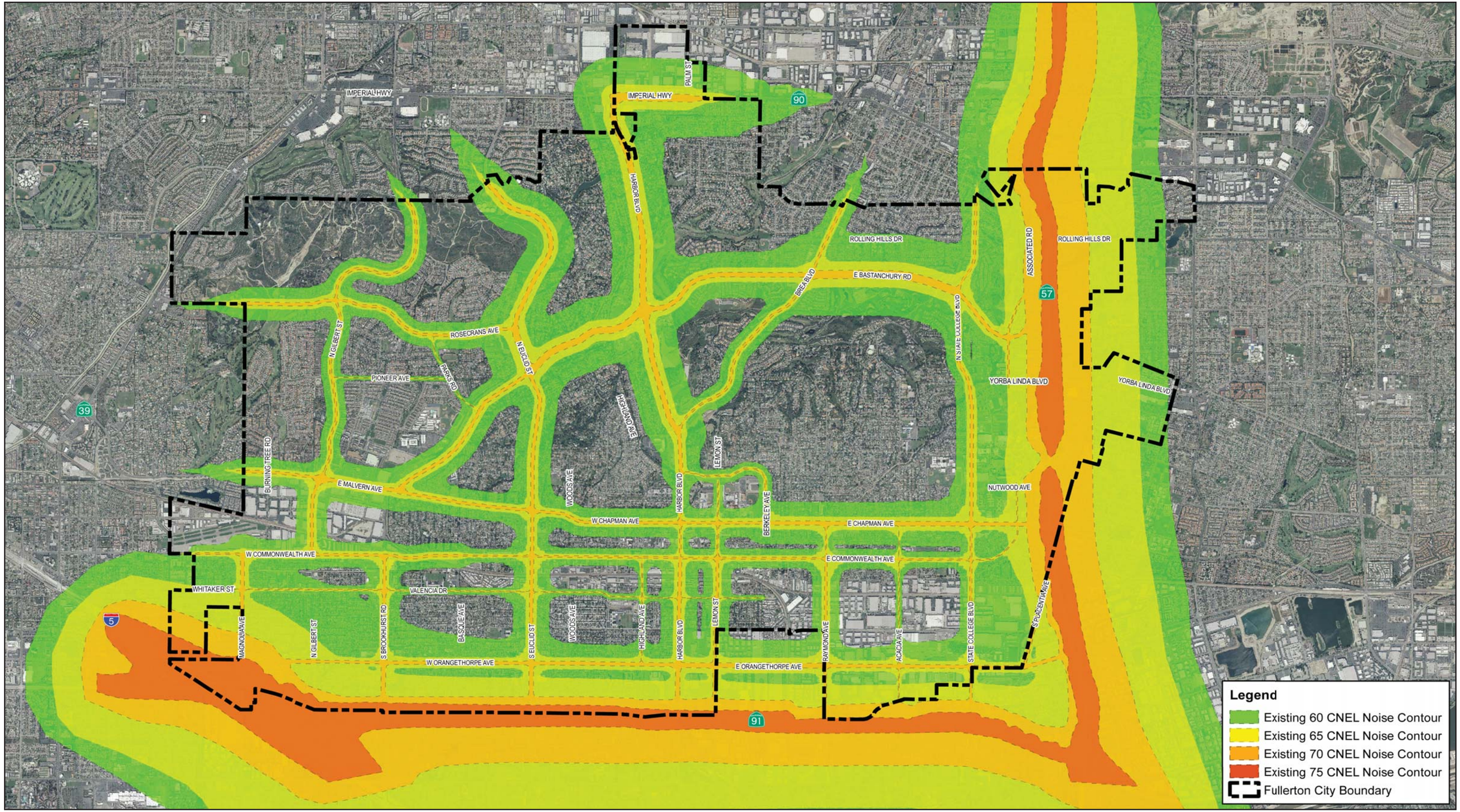
Motor Vehicle Noise

Roadway noise levels throughout the City were projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters. The FHWA model is based upon reference energy mean emission levels (REMELS) for automobiles, medium trucks (two axles) and heavy trucks (three or more axles), with consideration given to vehicle volume, speed, roadway configuration, distances to the receiver, and the acoustical characteristics of the site. To predict CNEL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The California Vehicle Noise (Calveno) traffic noise emission curves are used as recommended by the California Department of Transportation (Caltrans) to more accurately calculate noise levels generated by traffic in California. Additionally, freeway noise levels and contours were projected using the FHWA Traffic Noise Model version 2.5 (TNM 2.5). TNM 2.5 uses advances in personal computer hardware and software to improve upon the accuracy and ease of modeling noise from high volumes of traffic and high vehicle speeds associated with freeways.

Noise projections are based on vehicular traffic as derived from Kimley Horn Associates (June 2009 and July 2011). These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (i.e., number of lanes), the roadway width, the average daily traffic (ADT), vehicle travel speed, percentages of automobile and truck traffic, roadway grade, angle of view, and site conditions (hard or soft). The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and adjacent land uses. Existing noise contours were calculated for the City's primary and major arterials, refer to Table 5.6-4, *Existing Traffic Noise Levels*. In addition, a number of secondary and commuter streets were modeled as well. Noise generation for each roadway link was calculated and the distance to the 60 dBA CNEL, 65 dBA CNEL, and 70 dBA CNEL contours was determined. Exhibit 5.6-2, *Existing Roadway Noise Contours*, depicts the approximate location of the existing noise contours within the City.

As shown in Table 5.6-4, the existing traffic noise levels range from a low of 58.7 CNEL along Valencia Drive from both Highland Avenue and Harbor Boulevard and Harbor Boulevard and Lemon Street to a high of 71.1 CNEL along Bastanchury Road from Brea Boulevard to State College Boulevard.

Freeways typically result in greater noise levels than other roadways due to higher traffic volumes and vehicle speeds. As shown on Exhibit 5.6-2, SR-91, SR-57, and I-5 both traverse the City of Fullerton and represent a primary source of traffic noise. The following describes the traffic volumes and general characteristics of the freeways within the City of Fullerton.



Source: Kimley-Horn and Associates and ESRI Imagery.

NOT TO SCALE

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THE FULLERTON PLAN
PROGRAM ENVIRONMENTAL IMPACT REPORT

Existing Roadway Noise Contours

Exhibit 5.6-2

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Table 5.6-4
Existing Traffic Noise Levels

Roadway Segment	Existing					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Imperial Highway						
Harbor Boulevard and Palm Street	47,000	71.0	1462	462	146	100
Rosecrans Avenue						
West of Gilbert Street	20,000	67.3	622	197	62	95
Gilbert Street and Parks Road	14,000	65.7	435	138	44	70
Parks Road and Euclid Street	16,000	66.3	497	157	50	75
Bastanchury Road						
Malvern Avenue and Parks Road	15,000	67.3	605	191	61	90
Parks Road and Euclid Street	15,000	67.2	605	191	61	100
Euclid Street and Harbor Boulevard	31,000	70.2	1252	396	125	90
Harbor Boulevard and Brea Boulevard	37,000	68.6	866	274	87	75
Brea Boulevard and State College Boulevard	38,000	71.1	1534	485	153	110
State College Boulevard and SR-57	24,000	67.9	746	236	75	100
Malvern Avenue						
West of Burning Tree Road	23,000	67.0	539	171	54	95
Burning Tree Road and Gilbert Street	20,000	66.0	469	148	47	95
Gilbert Street and Bastanchury Road	32,000	67.9	749	237	75	95
Bastanchury Road and Euclid Street	23,000	66.5	539	170	54	85
Euclid Street and Woods Avenue	23,000	66.7	539	170	54	70
Chapman Avenue						
Woods Avenue and Harbor Boulevard	23,000	66.7	539	171	54	80
Harbor Boulevard and Berkeley Avenue	23,000	66.7	539	170	54	80
Berkeley Avenue and Acacia Avenue	34,000	68.4	797	252	80	80
Acacia Avenue and State College Boulevard	36,000	68.7	844	267	84	80
State College Boulevard and SR-57	31,000	67.9	726	230	73	80
Commonwealth Avenue						
West of Magnolia Avenue	14,000	64.4	328	104	33	75
Magnolia Avenue and Gilbert Street	23,000	66.8	539	170	54	80
Gilbert Street and Basque Avenue	20,000	66.2	469	148	47	80
Basque Avenue and Euclid Street	15,000	63.6	258	82	26	80
Euclid Street and Harbor Boulevard	19,000	64.6	328	104	33	95
Harbor Boulevard and Raymond Avenue	21,000	64.9	362	115	36	95
Raymond Avenue and Acacia Avenue	16,000	65.2	375	119	38	95
Acacia Avenue and State College Boulevard	13,000	64.2	305	96	31	75
State College Blvd and Nutwood Avenue	8,000	62.1	188	59	19	75
Whitaker Street						
West of Magnolia Avenue	7,000	60.4	121	38	12	70

Table 5.6-4 [continued]
Existing Traffic Noise Levels

Roadway Segment	Existing					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Valencia Drive						
Magnolia Avenue and Brookhurst Road	7,000	61.7	164	52	16	75
Brookhurst Road and Euclid Avenue	8,000	60.9	138	44	14	75
Euclid Avenue and Highland Avenue	7,000	60.2	121	38	12	75
Highland Avenue and Harbor Boulevard	5,000	58.7	86	27	9	80
Harbor Boulevard and Lemon Street	5,000	58.7	86	27	9	65
East of Lemon Street	6,000	59.5	103	33	10	65
Orangethorpe Avenue						
Magnolia Avenue and Gilbert Street	25,000	68.2	778	246	78	100
Gilbert Street and Brookhurst Road	17,000	66.5	529	167	53	100
Brookhurst Road and Euclid Avenue	21,000	67.5	653	206	65	100
Euclid Avenue and Harbor Boulevard	23,000	67.7	715	226	71	100
Harbor Boulevard and Raymond Avenue	30,000	68.9	934	295	93	100
Raymond Avenue and State College Boulevard	28,000	67.4	656	208	66	100
State College Boulevard and Placentia Avenue	27,000	67.2	633	200	63	100
Placentia Avenue and SR-57	31,000	67.8	726	230	73	105
Gilbert Street						
North of Rosecrans Avenue	13,000	65.2	404	128	40	110
Rosecrans Avenue and Malvern Avenue	21,000	64.9	362	115	36	100
Malvern Avenue and Commonwealth Avenue	33,000	66.9	569	180	57	90
Euclid Avenue						
North of Rosecrans Avenue	21,000	68.8	848	268	85	100
Rosecrans Avenue and Bastanchury Avenue	32,000	70.6	1290	408	129	100
Bastanchury Road and Malvern Avenue	28,000	67.6	656	207	66	75
Malvern Avenue and Commonwealth Avenue	34,000	67.1	587	185	59	80
Commonwealth Avenue and Orangethorpe Avenue	38,000	67.6	655	207	66	80
Orangethorpe Avenue and SR-91	48,000	68.4	828	262	83	75
Harbor Boulevard						
North of Imperial Highway	37,000	69.9	1151	364	115	115
Imperial Highway and Bastanchury Road	37,000	69.9	1151	364	115	95
Bastanchury Road and Brea Boulevard	32,000	69.1	996	315	100	100
Brea Boulevard and Berkeley Avenue	40,000	67.7	690	218	69	90
Berkeley Avenue and Chapman Avenue	36,000	64.1	309	98	31	80
Chapman Avenue and Commonwealth Avenue	36,000	64.1	309	98	31	75
Commonwealth Avenue and Orangethorpe Avenue	38,000	67.4	655	207	65	75
Orangethorpe Avenue and SR-91	48,000	68.4	828	262	83	75
Brea Boulevard						
North of Bastanchury Road	26,000	65.9	448	142	45	95
Bastanchury Road and Lemon Street	24,000	65.5	414	131	41	110
Lemon Street and Harbor Boulevard	18,000	64.3	310	98	31	100

Table 5.6-4 [continued]
Existing Traffic Noise Levels

Roadway Segment	Existing					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
State College Boulevard						
North of Bastanchury Road	25,000	65.5	431	136	43	120
Bastanchury Road and Yorba Linda Boulevard	27,000	65.8	466	147	47	110
Yorba Linda Boulevard and Nutwood Avenue	35,000	67.0	604	191	60	100
Nutwood Avenue and Chapman Avenue	36,000	67.4	620	196	62	100
Chapman Avenue and Commonwealth Avenue	21,000	65.0	363	115	36	80
Commonwealth Avenue and Orangethorpe Avenue	23,000	65.2	396	125	40	90
Orangethorpe Avenue and SR-91	30,000	65.9	517	164	52	90
Associated Road						
North of Bastanchury Road	10,000	64.4	311	98	31	80
Bastanchury Road and Yorba Linda Boulevard	10,000	64.4	311	98	31	80
Magnolia Avenue						
Commonwealth Avenue and SR-91	24,000	68.1	746	236	75	80
Brookhurst Road						
Commonwealth Avenue and Orangethorpe Avenue	24,000	66.8	562	178	56	75
Orangethorpe Avenue and SR-91	35,000	68.5	820	259	82	75
Highland Avenue						
Commonwealth Avenue and Valencia Drive	10,000	61.9	172	54	17	60
Valencia Drive and Orangethorpe Avenue	8,000	60.9	138	44	14	70
Lemon Street						
Berkeley Avenue and Chapman Avenue	14,000	61.9	173	55	17	70
Chapman Avenue and Commonwealth Avenue	20,000	63.4	247	78	25	80
Commonwealth Avenue and Orangethorpe Avenue	29,000	66.5	500	158	50	80
Orangethorpe Avenue and SR-91	37,000	67.5	638	202	64	80
Raymond Avenue						
Chapman Avenue and Commonwealth Avenue	14,000	63.3	242	76	24	65
Commonwealth Avenue and Orangethorpe Avenue	21,000	66.3	492	156	49	85
Orangethorpe Avenue and SR-91	29,000	66.4	500	158	50	90
Acacia Road						
Chapman Avenue and Commonwealth Avenue	6,000	59.5	103	33	10	85
Commonwealth Avenue and Orangethorpe Avenue	7,000	60.1	121	38	12	75
Orangethorpe Avenue and SR-91	6,000	60.8	141	44	14	75
Placentia Avenue						
SR-57 and SR-91	14,000	65.7	435	138	44	85
Berkeley Avenue						
Harbor Boulevard and Lemon Street	13,000	63.0	224	71	22	80
Lemon Street and Chapman Avenue	14,000	63.3	242	76	24	70
Pioneer Avenue						
Gilbert Street and Parks Road	5,000	58.9	86	27	9	85

Table 5.6-4 [continued]
Existing Traffic Noise Levels

Roadway Segment	Existing					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)[1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Parks Road						
Rosecrans Avenue and Bastanchury Avenue	5,000	58.9	86	27	9	85

ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Notes:

1. Roadway noise levels and contours were calculated using the FHWA RD-77-108 model. Freeway contours were calculated using TNM 2.5. TNM 2.5 produces graphical contours and does not report distances from the centerline to each contour. Therefore, numerical values for freeway contours are not provided above.

Source: Traffic noise modeling is based on traffic data provided by Kimley Horn and Associates, June 2009 and the Orange County Transportation Authority, *Annual Traffic Volume Maps*, 2007.

- ***State Route 57.*** SR-57 is a major north-south freeway that traverses through the eastern portion of the City of Fullerton. Based on data from the California Department of Transportation (Caltrans), average daily traffic along the segments of SR-57 that pass through Fullerton range from 248,000 vehicles to 273,000 vehicles for both northbound and southbound traffic.

- ***State Route 91.*** SR-91 is a major east-west freeway that traverses through the City of Fullerton. Based on Caltrans traffic data, average daily traffic along the segments of SR-91 that pass through the City range from 265,000 vehicles to 290,000 vehicles for both eastbound and westbound traffic.

- ***Interstate 5.*** I-5 is a major regional transportation corridor that serves as the backbone of the transportation system connecting the major urban centers of Los Angels County and Orange County. I-5 passes through a small portion of the southwestern corner of the City of Fullerton. Based on Caltrans traffic data, average daily traffic along the segments of I-5 that pass through the City is approximately 170,000 vehicles for both northbound and southbound traffic.

Under existing conditions, very few areas within the City experience traffic noise levels in excess of 70 CNEL. From the noise levels provided in Table 5.6-4, it can be inferred that the 70 dBA CNEL level is only exceeded at four of the 91 roadway links analyzed at 100 feet from the roadway centerline. It should be noted that the FHWA RD-77-108 models do not account for variations in topography, intervening structures, or soundwalls. The 70-dBA contour along these roadway links, located along Imperial Highway, Bastanchury Road, and Euclid Avenue, extends to a maximum of 153 feet from the roadway centerline. However, many of the City's commercial areas experience noise levels in excess of 65 CNEL adjacent to major arterial roadways and freeway rights-of-way. Residences located within this area may experience

unacceptable noise levels. It should be noted that these are modeled traffic noise levels, and are not based upon actual site measurements.

Truck Routes

Truck routes direct large trucks onto roadways that are designed to accommodate them. Truck routes are typically distant from sensitive receptor locations or noise levels have been appropriately mitigated to acceptable levels. The only designated truck route within the City's limits is Imperial Highway. Trucks must use the shortest possible route to arrive at their destination from Imperial Highway. Currently, approximately 47,000 vehicles travel along the segment of Imperial Highway that passes through the City each day. As the City grows and traffic levels increase, there is a potential for increased truck noise conflicts with adjacent land uses.

Rail Noise

Both Union Pacific Railroad (UPRR) and Burlington Northern and Santa Fe (BNSF) (previously Atchison, Topeka and Santa Fe) railroad tracks cross the City. Amtrak's Pacific Surfliner and Southwest Chief trains, as well as the Metrolink 91 Line and Orange County Line trains use the tracks on a shared right-of-way agreement. Additionally, BNSF has freight trains traversing the City during the daytime, evening, and nighttime periods. The line supports the freight transportation needs of local industry and freight train frequency changes according to local market demand. The Fullerton Train Station is located downtown at the Fullerton Transportation Center, which also serves as a major bus depot for the Orange County Transportation Authority (OCTA).

Aircraft and Airport Noise

Noise exposure contours around airports are determined from the number and type of aircraft using the airport, the magnitude and duration of each fly over, flight paths, and the time of day when flights occur. The Airport Noise Standards contained in Title 4 of the *California Administrative Code* specify that airports shall not permit noise exposures of 65 dB CNEL or greater to extend into residential or school areas. The State Aeronautics Act specifies 65 dB CNEL as the criterion which airports must meet to protect existing residential communities from unacceptable exterior exposures to aircraft noise. The exterior maximum of 65 dB CNEL is given as the level deemed acceptable to a reasonable person residing in urban residential areas where houses are of typical California construction and may have windows partially open.

The primary source of air traffic affecting noise levels within the City of Fullerton is the Fullerton Municipal Airport. The Orange County Airport Land Use Commission (ALUC) is an advisory body that ensures airport land use compatibility and reviews local agency land use actions and airport plans. Lead agencies are required to use the *Airport Land Use Planning Handbook* as a technical resource when assessing the airport related noise and safety impacts of airport vicinity projects. Table 5.6-5, *Airport Environs Land Use Plan Limitations Due to Aircraft Noise*, provides the Orange County Airport Land Use Commission land use plan limitations based on aircraft noise.

Table 5.6-5
Airport Environs Land Use Plan Limitations Due to Aircraft Noise

Land Use Category	CNEL						
	55	60	65	70	75	80	
Residential (all types): Single and Multi-Family Residences							
Community Facilities: Churches, Libraries, Schools, Preschools, Day-Care Centers, Hospitals, Nursing/Convalescent Homes, ad other Noise sensitive uses							
Commercial: Retail, Office							
Industrial							

CNEL = Community Noise Equivalent Level

Normally Consistent - Conventional construction methods used. No special noise reduction requirements.

Conditionally Consistent – Must use sound attenuation required by the California Noise Insulation Standards, Title 25, California Code of Regulations. Residential use sound attenuation required to ensure that the interior CNEL does not exceed 45 dB. Commercial and industrial structures shall be sound attenuated to meet Noise Impact Zone "1" criteria.

Normally Inconsistent – All residential units are inconsistent unless are sound attenuated to ensure that the interior CNEL does not exceed 45 dB, and that all units are indoor oriented so as to preclude noise impingement on outdoor living areas.

Source: Orange County Airport Land Use Commission, *Airport Environs Land Use Plan for Fullerton Municipal Airport*, November 18, 2004.

FULLERTON MUNICIPAL AIRPORT

The Fullerton Municipal Airport (International Air Transport Association [IATA] airport code: FUL), is a general aviation airport located on the southwestern boundary of the City, between Artesia Avenue and West Commonwealth Avenue. In conjunction with the Airport Noise and Safety Committee and the Fullerton Airport Pilots Association (FAPA), the Fullerton Municipal Airport has been active in reducing noise from the facility. FAPA has tested and found innovative methods to lessen noise impacts on take-off by adjusting engine revolutions per minute (RPM). The airport has a Runway 6 Preferred Policy which provides take-offs over the Fullerton industrial area to the east (when winds are permitting), rather than over residential areas within the City and in neighboring cities. In addition, the Fullerton Municipal Airport prohibits "pattern work" (flying in the traffic pattern to repeatedly practice take-offs and landings) after 10:00 PM, in order to minimize noise impacts to neighbors. The City of Fullerton also has an ordinance in effect which prohibits "touch and goes" between the hours of 6:00 PM and 7:00 AM on weekends and holidays (Chapter 18.03.30(28) of the Fullerton Municipal Code). However, this practice does not restrict pilots from departures or arrivals at the airport.

With the current level of aircraft activity, the impact of Fullerton Municipal Airport flight operations is considered significant at some existing residential locations in the City. However, as the flight tracks extend over the majority of City, there are few areas that are not affected by

these operations. It should be noted that the California Highway Patrol, Anaheim Police Department, and Orange County Fire Authority maintain helicopters on the airfield.

STATIONARY NOISE SOURCES

Commercial and industrial land uses located near residential areas currently generate occasional noise impacts. The primary noise sources associated with these facilities are caused by delivery trucks, air compressors, generators, outdoor loudspeakers, and gas venting. Other significant stationary noise sources in the City may include noise from construction activities and landscaping equipment. Residential land uses and areas identified as noise-sensitive must be protected from excessive noise from stationary sources including commercial and industrial centers. These impacts are best controlled through effective land use planning and application of the City Noise Ordinance.

Construction

Construction noise is one of the most common stationary noise sources in the City. The use of pile drivers, drills, trucks, pavers, graders, and a variety of other equipment can result in short, sporadic elevated noise levels. Although construction noise impacts are generally short-term in nature, it can often disturb nearby sensitive uses.

Parks

The City of Fullerton has a total of 50 public parks with more than 635 acres, the largest of which include Brea Dam Recreational Area (126 acres) and Hillcrest Park (37.8 acres). Additionally, the City's largest regional park is the Craig Regional Park with 124 acres). The Fullerton Parks and Recreation Department, which is responsible for the development and maintenance of the City's park facilities, offers after school programs, youth and adult sport programs (i.e., softball, racquet ball, swimming, tennis, etc.).

Commercial Corridor

Commercial development covers a broad spectrum of uses including retail, office, and service commercial. Overall, seven percent (842 acres) of the total land within the City has a commercial use. The commercial uses are generally located along major corridors along the Harbor Boulevard corridor, as well as along Orangethorpe Avenue and Euclid Avenue. Community and neighborhood shopping centers are located throughout the City. Auto related commercial uses are concentrated along Commonwealth Avenue and Euclid Street, near the railroad corridor and SR-91.

A variety of stationary noise sources associated with commercial activities exists throughout the City of Fullerton. Commercial noise sources may include mechanical equipment and engines in non-moving motors such as power tools. Additional stationary noise sources include animals, stereos, musical instruments, sporting events, and horns. These noise sources have the potential to temporarily disrupt the quietness of an area.

Industrial Noise

Industrial noise sources are located in industrial zoned properties throughout the City. In general, industrial noise sources are not creating large-scale problems, but some localized noise problems related to industrial sources do exist. The major industrial zones in the City are the Southeast Industrial area, the Airport Industrial Area, and the Northern Industrial Area. Additionally, industrial uses are found along the BNSF Railroad Corridor.

Industrial land uses have the potential to generate noise that can be considered intrusive to sensitive land uses. Depending on the type of industrial operation, noise sources could involve mechanical equipment, loading and unloading of vehicles and trucks, as well as amplified or un-amplified communications. The level and intrusiveness of the noise generated also vary depending on the size and type of the facility, type of business, hours of operation, and location relative to sensitive land uses.

SENSITIVE NOISE RECEPTORS

Sensitive populations are more susceptible to the effects of noise and air pollution than are the general population. Land uses considered sensitive by the State of California include schools, playgrounds, athletic facilities, hospitals, rest homes, rehabilitation centers, long-term care, and mental care facilities. Some jurisdictions also consider day care centers, single-family dwellings, mobile home parks, churches, and libraries to be sensitive to noise and air pollutants. Generally, a sensitive receptor is identified as a location where human populations (especially children, senior citizens, and sick persons) are present, and where there is a reasonable expectation of continuous human exposure to noise.

According to the City of Fullerton, there are very few noise complaints that are reported within the City. The majority of the calls include complaints about after hours construction activities, loud music, motorcycles, and trains traveling along the Metrolink/BNSF lines. Land uses less sensitive to noise are business, commercial, and professional developments. Noise receptors categorized as being least sensitive to noise include industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, motorcycle parks, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals. These types of land uses often generate high noise levels. Moderately sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, and outpatient clinics. Current land uses located within the City of Fullerton that are sensitive to intrusive noise include residential uses, schools, hospitals, churches, and parks.

AMBIENT NOISE

Fullerton's noise environment is dominated by vehicular traffic, including vehicular generated noise along SR-57, SR-91, and I-5, as well as major and primary arterials. The primary arterials that serve the City are Chapman Avenue, Harbor Boulevard, Euclid Street, and Orangethorpe Avenue. These roadways have been designed to specifically carry large volumes, although long-established land use patterns have placed residential uses along some portions of these roadways.

Noise measurements were taken throughout the City of Fullerton at 17 locations as illustrated in Exhibit 5.6-3, *Noise Measurement Locations*. Based upon the research conducted for the City's development patterns, the City was divided into Acoustical Analysis Zones (AAZ) to identify areas of homogenous acoustical conditions. Aerial imagery with a one-foot pixel resolution was utilized for a visual representation of the City's roadway and land use layout. In addition, the City's existing land use map and proposed Focus Area maps were utilized to determine the City's existing and proposed patterns of development.

The noise measurement locations were selected as a representative sample of the more urbanized portions of the City in order to identify ambient baseline levels. Noise measurements were conducted during non-peak traffic hours because free flowing traffic conditions yield higher noise levels, as opposed to rush hour traffic during peak hours when vehicle speeds and heavy truck volumes are low. The noise measurements described in Table 5.6-6, *Existing Noise Levels*, were taken adjacent to major roadways in the City to determine peak noise levels at worst-case sensitive receptor locations.

Noise levels at the selected sensitive receptor sites were measured by RBF Consulting on February 4 and 11, 2009, using a Brüel & Kjær model 2250 sound level meter (SLM) equipped with Brüel & Kjær pre-polarized freefield microphone, which meets standards of the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Each measurement was for 10 minutes, and the sound meter was calibrated before each measurement was taken.

- ***Measurement Site 1*** was located at the within Gilbert park close to Orangethorpe Avenue. Sources of peak noise included traffic from Orangethorpe Avenue, pedestrians, and dogs barking. The noise level monitored at Site 1 was 52.8 dBA.

- ***Measurement Site 2*** was located on at the Orangefair Marketplace on the corner of Orangethorpe Avenue and Harbor Boulevard. The monitored noise level was 62.9 dBA, with the majority of noise from traffic and vehicles in the parking lot.

- ***Measurement Site 3*** was located on Sally Place, south of Valencia Drive. The monitored noise level was 65.5 dBA with peak noise from trucks serving nearby warehouses, HVAC units, and a train pass-by.

- ***Measurement Site 4*** was located on Harrington Drive, off of Wilshire Avenue. Sources of peak noise included landscaping maintenance, barking dogs, and local traffic. The monitored noise level was 43.6 dBA.

- ***Measurement Site 5*** was located along an alley west of Fullerton Union High School near the McDonalds Restaurant. The monitored noise level was 56.3 dBA. The source of peak noise included traffic along Chapman Avenue and parking lot noise.

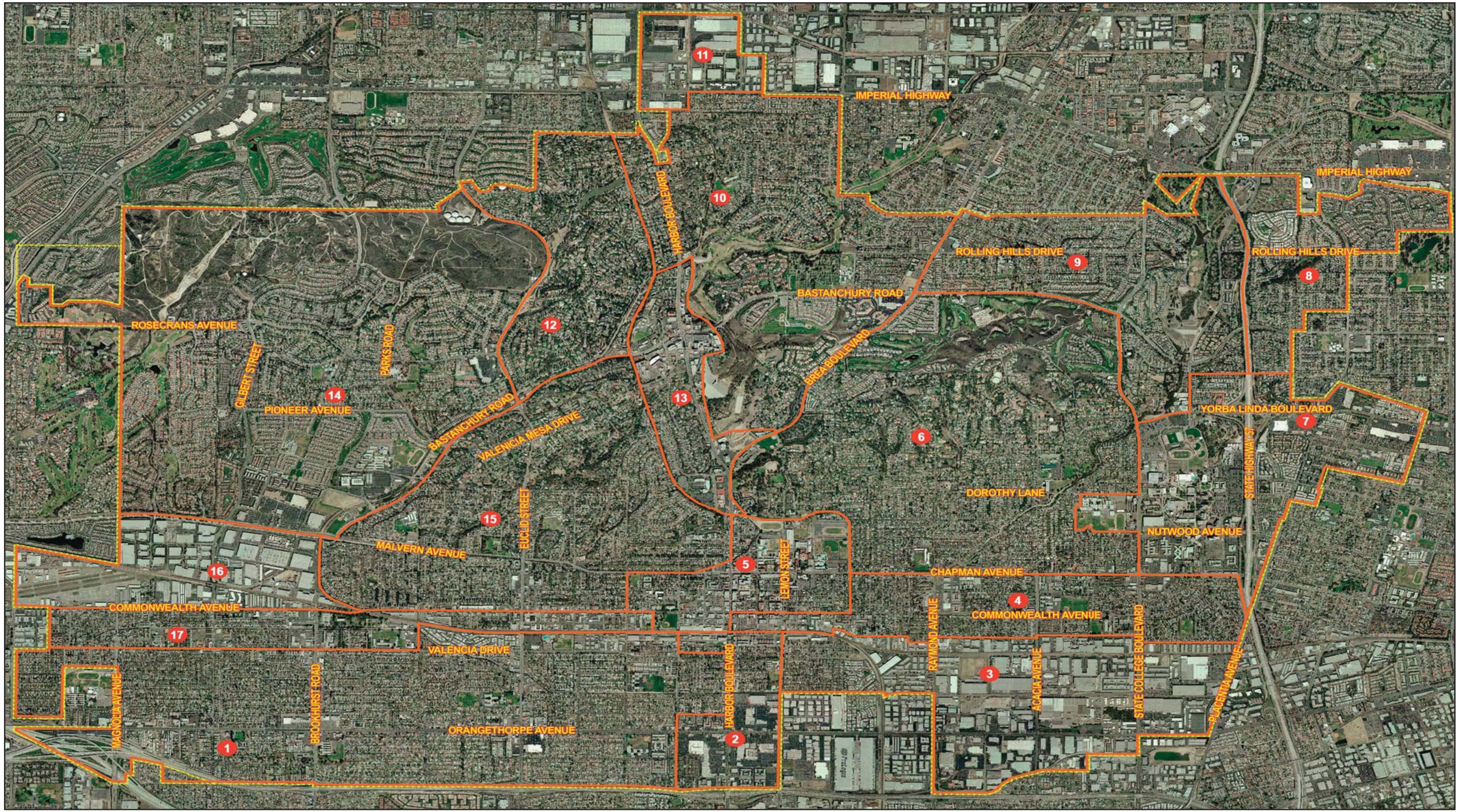
- ***Measurement Site 6*** was located on the Kenwood Place cul-de-sac off of Raymond Avenue. The monitored noise level was 43.4 dBA. Sources of peak noise were from traffic on Raymond Avenue and landscape maintenance activities.

Table 5.6-6
Existing Noise Levels

Site No.	Location	Leq (dBA)	Lmin (dBA)	Lmax (dBA)	Peak (dBA)	Date and Time
1	Within Gilbert Park, off of Orangethorpe Avenue	52.8	45.6	64.1	89.0	February 4, 2009 9:47 a.m. – 9:57 a.m.
2	Orangefair Marketplace (Orangethorpe Avenue and Harbor Boulevard)	62.9	51.4	82.5	101.2	February 4, 2009 10:12 a.m. – 10:22 a.m.
3	Sally Place cul-de-sac south of Valencia Drive	65.5	55.4	90.6	101.6	February 4, 2009 10:49 a.m. – 10:59 a.m.
4	Harrington Drive cul-de-sac, off of Wilshire Avenue	43.6	35.5	61.2	79.2	February 4, 2009 11:05 a.m. – 11:15 a.m.
5	Alley adjacent to McDonald's and west of Fullerton Union High School	56.3	46.6	70.0	91.1	February 4, 2009 11:30 a.m. – 11:40 a.m.
6	Kenwood Place cul-de-sac, off of Raymond Avenue	43.4	34.4	59.1	82.5	February 4, 2009 11:48 a.m. – 11:58 a.m.
7	Albertson's parking lot (Yorba Linda Boulevard/North Placentia Avenue)	58.6	49.8	72.3	96.9	February 4, 2009 12:18 p.m. – 12:28 p.m.
8	Middlesex Place off of Claremont Avenue	58.8	37.0	81.5	95.3	February 11, 2009 10:13 a.m. – 10:23 a.m.
9	Mimosa Place south of East Rolling Hills Drive	44.6	36.2	62.0	79.8	February 11, 2009 10:35 a.m. – 10:45 a.m.
10	Sunnywood Drive off of Hermosa Drive	40.3	34.9	54.6	77.7	February 11, 2009 11:02 a.m. – 11:12 a.m.
11	Bonita Place north of Imperial Highway	50.4	43.2	65.1	86.2	February 11, 2009 11:23 a.m. – 11:33 a.m.
12	Rancho Circle (off of Terraza Place)	42.6	33.8	59.4	85.9	February 11, 2009 12:10 p.m. – 12:20 p.m.
13	Sunnycrest Drive off of North Johnston Knolls	46.1	40.2	57.6	87.7	February 11, 2009 11:45 p.m. –11:55 p.m.
14	Mariposa Lane off of Pioneer Avenue/ Camino Centroloma	52.4	40.3	71.4	88.1	February 11, 2009 2:02 p.m. – 2:12 p.m.
15	Arroyo Drive/ Arroyo Place	58.8	39.2	77.5	97.5	February 11, 2009 2:25 p.m. – 2:35 p.m.
16	Raymer Avenue, off of Gilbert Street, near Fullerton Municipal Airport	58.7	50.4	79.4	96.1	February 11, 2009 2:45 p.m. – 2:55 p.m.
17	Pritchard Avenue, off of Valencia Drive	53.4	50.2	65.8	85.5	February 11, 2009 3:05 p.m. – 3:15 p.m.

Leq = equivalent sound level; dBA = A-weighted decibel.

Source: RBF Consulting, *Noise Monitoring Survey,* February 4 and 11, 2009.



NOT TO SCALE

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THE FULLERTON PLAN
PROGRAM ENVIRONMENTAL IMPACT REPORT

Noise Measurement Locations

Exhibit 5.6-3

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- ***Measurement Site 7*** was located in the Albertson's parking lot located on Yorba Linda Boulevard and North Placentia Avenue. Sources of peak noise included traffic from Yorba Linda Boulevard and North Placentia Avenue. The monitored noise level was 58.6 dBA.

- ***Measurement Site 8*** was located on Middlesex Place, off of Claremont Avenue. Sources of peak noise included barking dogs and landscaping maintenance activities. The monitored noise level was 58.8 dBA.

- ***Measurement Site 9*** was located on Mimosa Place south of Rolling Hills Drive. Sources of peak noise included the occasional automobile and overhead aircraft. The monitored noise level was 44.6 dBA.

- ***Measurement Site 10*** was located on Sunnywood Drive off of Hermosa Drive. The monitored noise level was 40.3 dBA and peak noise included overhead aircraft and traffic noise.

- ***Measurement Site 11*** was located on Bonita Place north of Imperial Highway. Peak noise included traffic along Imperial Highway, industrial manufacturing uses. The monitored noise level was 50.4 dBA.

- ***Measurement Site 12*** was located on Rancho Circle. Peak noise included traffic from Terraza Place and overhead aircraft. The monitored noise level was 42.6 dBA.

- ***Measurement Site 13*** was located on Sunny Crest Drive off of North Johnston Knolls. Peak Noise included traffic along Harbor Boulevard. The monitored noise level was 46.1 dBA.

- ***Measurement Site 14*** was located on Mariposa Lane off of Pioneer Avenue/Camino Centroloma. Peak noise included traffic along Pioneer Avenue, dogs barking, and overhead aircraft. The monitored noise level was 52.4 dBA.

- ***Measurement Site 15*** was located on Arroyo Drive. Sources of peak noise included traffic, overhead aircraft, and nearby construction. The monitored noise level was 58.8 dBA.

- ***Measurement Site 16*** was located on Raymer Avenue off of Gilbert Street, near the Fullerton Municipal Airport. Sources of peak noise included traffic, overhead aircraft, cars in a nearby parking lot, and a train pass-by. The monitored noise level was 58.7 dBA.

- ***Measurement Site 17*** was located on Prichard Avenue off of Valencia Drive. Sources of peak noise included traffic on Valencia Drive, and children playing at nearby school. The monitored noise level was 53.4 dBA.

5.6.4 SIGNIFICANCE THRESHOLDS AND CRITERIA

Appendix G of the *CEQA Guidelines* contains the Initial Study Environmental Checklist, which was included with the Notice of Preparation to show the areas being analyzed within the EIR; refer to Appendix A of this EIR. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this Section. Accordingly, a project would typically have a significant impact on noise if the project would result in any of the following:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive ground-borne vibration or ground-borne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- 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; and/or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Based on these standards, the Project's impacts have been categorized as either "less than significant" or "potentially significant." Mitigation measures are recommended to avoid or lessen potentially significant impacts. If a potentially significant impact cannot be avoided or reduced to a less than significant level through implementation of the recommended mitigation, it is categorized as "significant and unavoidable."

CUMULATIVE NOISE EXPOSURE

Significance of Changes in Traffic Noise Levels

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent sensitive receptors. In addition to being concerned about the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing noise environment. In community noise assessments, it is "generally not significant" if no noise-sensitive sites are located within the project vicinity, or if permanent increases in community noise levels associated with implementation of the project would not exceed +3 dB at noise-sensitive locations in the project vicinity.[1] A limitation in using a single value to evaluate an impact related to a noise level increase would be the failure to account for the preexisting ambient noise

[1] California Department of Transportation, *Technical Noise Supplement*, November 2009.

environment to which a person has become accustomed. Studies assessing the percentage of people highly annoyed by changes in ambient noise levels indicate that when ambient noise levels are low, a greater change is needed to cause a response. As ambient noise levels increase, a lesser change in noise levels is required to elicit significant annoyance. The significance criteria listed in Table 5.6-7, *Significance of Changes in Cumulative Noise Exposure*, are based on published guidance from the Federal Interagency Committee on Noise (FICON), the California Department of Transportation (Caltrans), and OPR, and considered to correlate well with human response to permanent changes in ambient noise levels.

Table 5.6-7
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Project (Ldn or CNEL)	Significant Impact Assumed to Occur if the Ambient Noise Level is Increased by:
< 60 dBA	5.0 dBA or more
> 60 dBA	3.0 dBA or more
Sources: California Department of Transportation, *Technical Noise Supplement*, November 2009. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.	

5.6.5 PROJECT IMPACTS AND MITIGATION MEASURES

SHORT-TERM CONSTRUCTION NOISE

- **CONSTRUCTION-RELATED ACTIVITIES RESULTING FROM IMPLEMENTATION OF THE FULLERTON PLAN COULD GENERATE NOISE LEVELS IN EXCESS OF ESTABLISHED STANDARDS.**

Impact Analysis: Typical activities associated with construction are a highly noticeable temporary noise source. Noise from construction activities is generated by two primary sources: (1) the transport of workers and equipment to construction sites and (2) the noise related to active construction equipment. These noise sources can be a nuisance to local residents and businesses or unbearable to sensitive receptors (i.e., residences, hospitals, senior centers, schools, day care facilities, etc.).

While implementation of The Fullerton Plan would not directly result in new development within the City, it would facilitate additional development, which would generate noise during construction activities. New development potential within the City would primarily occur within the Focus Areas, and throughout the City where existing development has not reached the potential allowed by the General Plan designations. It is unlikely the City would experience intensive construction activity with implementation of The Fullerton Plan. Construction noise levels have not been modeled at this program level of analysis, as the extent and timing of future construction activities within the City are unknown at this time.

Goals, policies, and actions in The Fullerton Plan include actions to limit exposure of noise-sensitive land uses to excessive noise levels from point sources such as construction activities. The City would also require each project to implement The Fullerton Plan strategies and

mitigation measures requiring applicants to implement construction best management practices (BMPs) to reduce construction noise levels that address construction-related noise (Mitigation Measures N-1 and N-2) in order to minimize impacts to surrounding sensitive receptors. Through the environmental review process for individual projects, additional mitigation may also be required to further reduce construction-related noise impacts to a less than significant level.

Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended Mitigation Measures N-1 and N-2, would reduce short-term construction noise impacts to less than significant levels.

Proposed General Plan Update Policies and Actions:

P8.1 ***Noise Reduction Measures***
Support regional and subregional efforts to implement projects or programs that abate and/or attenuate noise across jurisdictions, particularly where the source is not under the City's authority.

P8.6 ***Noise Receptors***
Support projects, programs, policies and regulations to permit uses where the noise level of the surroundings—after taking into account noise insulation features and other control techniques of the use—is not detrimental to the use.

P8.7 ***Noise Generators***
Support projects, programs, policies and regulations to permit uses and/or activities where the noise generated by the use and/or activity is not detrimental or otherwise a nuisance to the surroundings.

A8.1 ***Noise Ordinance***
Update the City's Noise Ordinance to comply with the policies of The Fullerton Plan and to address noise issues in the community.

Mitigation Measures:

N-1 Project applicants shall ensure through contract specifications that construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels. Contract specifications shall be included in construction documents, which shall be reviewed by the City prior to issuance of a grading or building permit (whichever is issued first). The construction BMPs shall include the following:

- Ensure that construction equipment is properly muffled according to industry standards and be in good working condition.
- Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible.

- Schedule high noise-producing activities between the hours of 7:00 AM and 8:00 PM on any day except Sunday or a City-recognized holiday to minimize disruption on sensitive uses.

- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective action, and report the action taken to the reporting party.

N-2 Project applicants shall require by contract specifications that heavily loaded trucks used during construction would be routed away from residential streets to the extent feasible. Contract specifications shall be included in construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

Level of Significance After Mitigation: Less Than Significant Impact.

SHORT-TERM CONSTRUCTION NOISE

■ CONSTRUCTION-RELATED ACTIVITIES RESULTING FROM IMPLEMENTATION OF THE FULLERTON PLAN COULD GENERATE OR EXPOSE PERSONS OR STRUCTURES TO EXCESSIVE GROUND-BORNE VIBRATION.

Impact Analysis: Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency relative to displacement, velocity, or acceleration. Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings. PPV and RMS vibration velocity are normally described in inches per second (inches/second). Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. The response of the human body to vibration relates

well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity. Similar to airborne sound, vibration velocity can be expressed in decibel notation as vibration decibels (VdB). The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration.

The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 25 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. Construction activities that may result under The Fullerton Plan have the potential to generate low levels of ground-borne vibration. Table 5.6-8, *Typical Vibration Levels For Construction Equipment*, identifies various vibration velocity levels for types of construction equipment that would operate within the City during construction.

Table 5.6-8
Typical Vibration Levels For Construction Equipment

Equipment	Approximate ground velocity in decibels at 25 feet (VdB)	Approximate ground velocity in decibels at 50 feet (VdB)
Pile Driver (impact)	104	98
Large Bulldozer	87	81
Loaded Trucks	86	80
Jackhammer	79	73
Small Bulldozer	58	52
Notes: Root mean square amplitude ground velocity in decibels (VdB) referenced to 1 micro-inch/second.		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006.		

Similar to noise, ground-borne vibration would attenuate at a rate of approximately 6 VdB per doubling of distance. The ground-borne vibration generated during construction activities would primarily impact existing sensitive uses that are located adjacent to or within the vicinity of specific projects. Based upon the information provided in Table 5.6-8, vibration levels could reach up to 87 VdB for typical construction activities (and up to 104 VdB if pile driving activities were to occur) at sensitive uses located within 25 feet of construction. For sensitive uses that are located at or within 25 feet of potential project construction sites, sensitive receptors at these locations may experience vibration levels during construction activities that exceed the FTA's vibration impact threshold of 85 VdB for human annoyance. However, pursuant to Mitigation Measure N-3, should construction activities take place within 25 feet of an occupied structure, a project-specific vibration impact analysis shall be conducted, resulting in a less than significant impact.

Compliance and/or adherence to the City's Noise Ordinance, goals, polices, and actions in The Fullerton Plan, and the recommended Mitigation Measure N-3 and N-4 would reduce the generation and/or exposure of persons or structures to excessive ground-borne vibration.

Proposed General Plan Update Policies and Actions: Refer to the Policies and Actions cited above.

Mitigation Measures:

N-3 Project applicants shall ensure by contract specifications that construction staging areas along with the operation of earthmoving equipment within the City would be located as far away from vibration and noise sensitive sites as possible. Should construction activities take place within 25 feet of an occupied structure, a project specific vibration impact analysis shall be conducted to determine the specific vibration control mechanisms that would be incorporated into the project's construction bid documents, if necessary. Contract specifications shall be included in construction documents, which shall be reviewed by the City prior to issuance of a grading permit.

N-4 The City shall require future developments to implement the following measures to reduce the potential for architectural/structural damage resulting from elevated groundborne noise and vibration levels:

- Pile driving within a 50-foot radius of historic structures shall utilize alternative installation methods where possible (e.g., pile cushioning, jetting, predrilling, cast-in-place systems, resonance-free vibratory pile drivers).

- The preexisting condition of all designated historic buildings within a 50-foot radius of proposed construction activities shall be evaluated during a preconstruction survey. The preconstruction survey shall determine conditions that exist before construction begins for use in evaluating damage caused by construction activities. Fixtures and finishes within a 50-foot radius of construction activities susceptible to damage shall be documented (photographically and in writing) prior to construction. All damage shall be repaired back to its preexisting condition.

- Vibration monitoring shall be conducted prior to and during pile driving operations occurring within 100 feet of the historic structures. Every attempt shall be made to limit construction-generated vibration levels in accordance with Caltrans recommendations during pile driving and impact activities in the vicinity of the historic structures.

Level of Significance After Mitigation: Less Than Significant Impact.

LONG-TERM OPERATIONAL IMPACTS

- **FUTURE NOISE LEVELS ASSOCIATED WITH IMPLEMENTATION OF THE FULLERTON PLAN COULD CONTRIBUTE TO AN EXCEEDANCE OF THE CITY'S NOISE STANDARDS RESULTING IN POTENTIAL NOISE IMPACTS TO SENSITIVE RECEPTORS.**

Impact Analysis:

MOBILE SOURCES

Existing and future noise levels have been calculated for various roadway segments within the City of Fullerton. Table 5.6-4 outlines the City's existing roadway noise levels and Exhibit 5.6-2 illustrates the existing noise contours. Table 5.6-9, *Buildout Traffic Noise Levels*, outlines the City's future roadway noise levels under proposed Fullerton Plan buildout conditions and Exhibit 5.6-4, *General Plan Buildout Noise Contours*, illustrates The Fullerton Plan noise contours. The following is a summary of the calculated traffic noise levels associated with buildout under The Fullerton Plan:

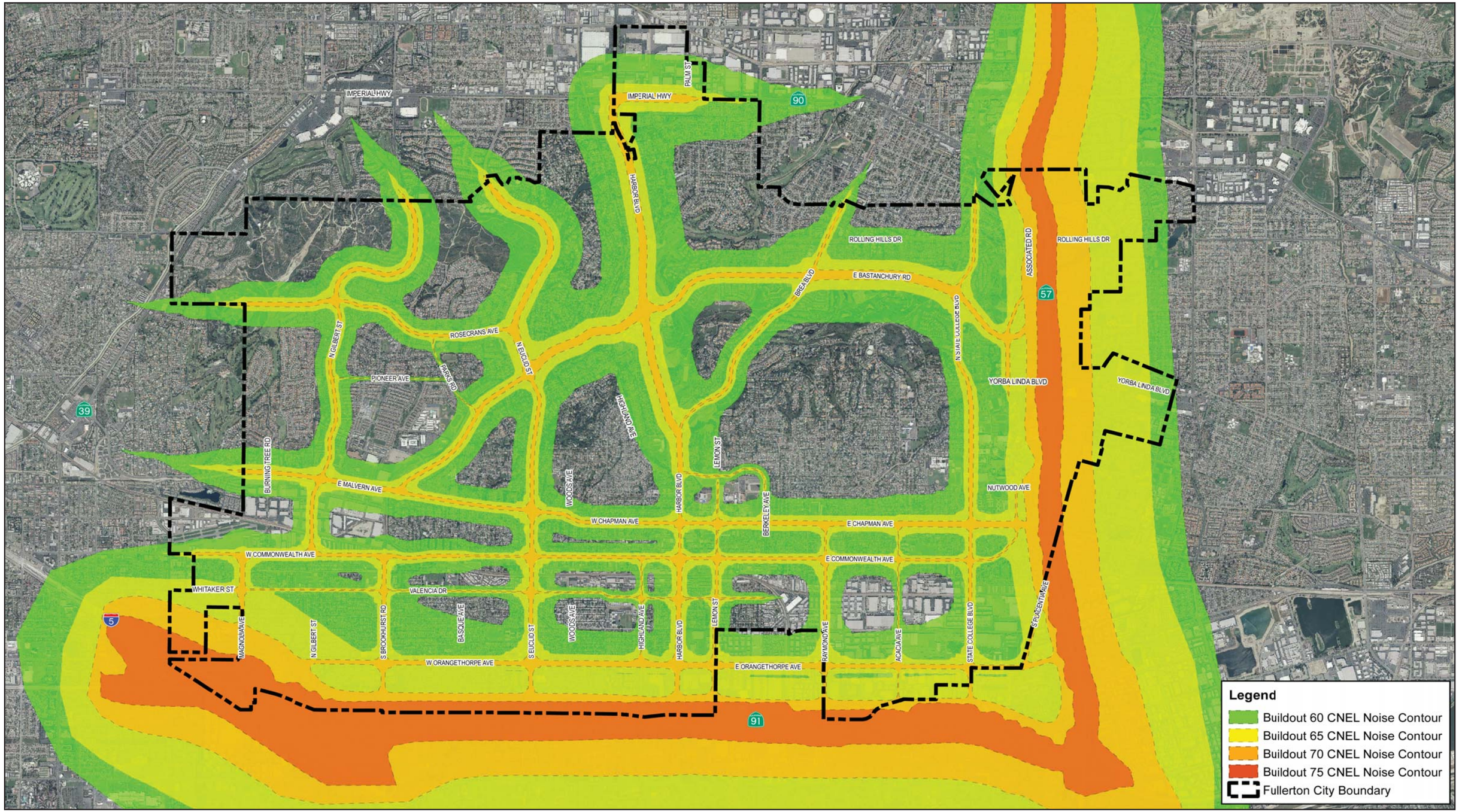
- Eight of the roadway segments modeled (along Imperial Highway, Bastanchury Road, Chapman Avenue, Euclid Avenue, and Harbor Boulevard) would generate noise levels above 70 dBA CNEL at 100 feet from centerline.

- Sixty-three of the roadway segments modeled (along Rosecrans Avenue, Bastanchury Road, Malvern Avenue, Chapman Avenue, Commonwealth Avenue, Orangethorpe Avenue, Gilbert Street, Euclid Avenue, Harbor Boulevard, Brea Boulevard, State College Boulevard, Associated Road, Magnolia Avenue, Brookhurst Road, Lemon Street, Raymond Avenue, and Placentia Avenue) would generate noise levels between 65 dBA CNEL and 70 dBA CNEL at 100 feet from the centerline.

- Twenty modeled roadway segments (along Commonwealth Avenue, Whitaker Street, Valencia Drive, Highland Avenue, Lemon Street, Raymond Avenue, Acacia Road, Berkeley Avenue, Pioneer Avenue, and Parks Road) would generate noise levels between 60 dBA CNEL and 65 dBA CNEL at 100 feet from the centerline.

It is noted that the computer noise model used to project the potential ambient noise levels with implementation of The Fullerton Plan does not consider the existing noise attenuating features such as sound walls, buildings, landscaping, or topography. As such, the roadway noise contours may not reflect true noise conditions. Intervening structures or other noise-attenuating obstacles between the roadway and sensitive receptors may reduce roadway noise levels at the receiving receptor. However, there would almost certainly be receptors that would experience roadway noise levels very similar to those indicated by the noise contours.

With implementation of The Fullerton Plan, some residential uses would experience noise levels that would exceed the City's Noise and Land Use Criteria Compatibility Criteria (refer to Table 5.6-2) due to the increase in roadway noise. However, adherence to and implementation of The Fullerton Plan goals, policies, and actions, program-level traffic noise impacts would be less than significant. Individual development projects would be reviewed for project-specific impacts during any required environmental review. If project-specific significant impacts are identified, specific mitigation measures can be placed on the project as conditions of approval.



Source: Kimley-Horn and Associates and ESRI Imagery.

NOT TO SCALE

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THE FULLERTON PLAN
PROGRAM ENVIRONMENTAL IMPACT REPORT

General Plan Buildout Noise Contours

Exhibit 5.6-4

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Table 5.6-9
Buildout Traffic Noise Levels

Roadway Segment	Buildout					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Imperial Highway						
Harbor Boulevard and Palm Street	52,000	71.4	1,618	512	162	100
Rosecrans Avenue						
West of Gilbert Street	27,000	68.6	839	265	84	95
Gilbert Street and Parks Road	18,000	66.8	560	177	56	70
Parks Road and Euclid Street	20,000	67.3	622	197	62	75
Bastanchury Road						
Malvern Avenue and Parks Road	18,000	68.0	726	230	73	90
Parks Road and Euclid Street	21,000	68.6	847	268	85	100
Euclid Street and Harbor Boulevard	40,000	71.3	1,613	510	161	90
Harbor Boulevard and Brea Boulevard	41,000	69.0	961	304	96	75
Brea Boulevard and State College Boulevard	44,000	71.7	1,777	562	178	110
State College Boulevard and SR-57	32,000	69.2	995	315	99	100
Malvern Avenue						
West of Burning Tree Road	39,000	69.3	914	289	91	95
Burning Tree Road and Gilbert Street	34,000	68.3	796	252	80	95
Gilbert Street and Bastanchury Road	40,000	68.9	937	296	94	95
Bastanchury Road and Euclid Street	29,000	67.8	680	215	68	85
Euclid Street and Woods Avenue	30,000	67.9	704	222	70	70
Chapman Avenue						
Woods Avenue and Harbor Boulevard	28,000	67.5	656	207	66	80
Harbor Boulevard and Berkeley Avenue	31,000	68.0	727	230	73	80
Berkeley Avenue and Acacia Avenue	40,000	69.1	938	297	94	80
Acacia Avenue and State College Boulevard	47,000	69.8	1,102	349	110	80
State College Boulevard and SR-57	53,000	70.2	1,242	393	124	80
Commonwealth Avenue						
West of Magnolia Avenue	24,000	66.7	563	178	56	75
Magnolia Avenue and Gilbert Street	33,000	68.4	773	244	77	80
Gilbert Street and Basque Avenue	28,000	67.5	656	207	66	80
Basque Avenue and Euclid Street	22,000	65.3	380	120	38	80
Euclid Street and Harbor Boulevard	31,000	66.7	535	169	53	95
Harbor Boulevard and Raymond Avenue	35,000	67.1	604	191	60	95
Raymond Avenue and Acacia Avenue	26,000	67.4	610	193	61	95
Acacia Avenue and State College Boulevard	21,000	66.3	492	156	49	75
State College Blvd and Nutwood Avenue	14,000	64.6	328	104	33	75
Whitaker Street						
West of Magnolia Avenue	10,000	61.9	172	55	17	70

Table 5.6-9 [continued]
Buildout Traffic Noise Levels

Roadway Segment	Buildout					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Valencia Drive						
Magnolia Avenue and Brookhurst Road	10,000	63.2	234	74	23	75
Brookhurst Road and Euclid Avenue	12,000	62.7	207	65	21	75
Euclid Avenue and Highland Avenue	12,000	62.5	207	65	21	75
Highland Avenue and Harbor Boulevard	11,000	62.1	190	60	19	80
Harbor Boulevard and Lemon Street	11,000	62.1	190	60	19	65
East of Lemon Street	13,000	62.8	224	71	22	65
Orangethorpe Avenue						
Magnolia Avenue and Gilbert Street	30,000	69.0	933	295	93	100
Gilbert Street and Brookhurst Road	26,000	68.3	808	255	81	100
Brookhurst Road and Euclid Avenue	29,000	68.9	901	285	90	100
Euclid Avenue and Harbor Boulevard	35,000	69.5	1,087	344	109	100
Harbor Boulevard and Raymond Avenue	36,000	69.7	1,120	354	112	100
Raymond Avenue and State College Boulevard	36,000	68.5	844	267	84	100
State College Boulevard and Placentia Avenue	36,000	68.4	844	267	84	100
Placentia Avenue and SR-57	40,000	68.9	938	297	94	105
Gilbert Street						
North of Rosecrans Avenue	28,000	68.6	871	276	87	110
Rosecrans Avenue and Malvern Avenue	34,000	67.0	586	185	59	100
Malvern Avenue and Commonwealth Avenue	39,000	67.6	673	213	67	90
Euclid Avenue						
North of Rosecrans Avenue	29,000	70.2	1,171	370	117	100
Rosecrans Avenue and Bastanchury Avenue	37,000	71.2	1,495	473	149	100
Bastanchury Road and Malvern Avenue	31,000	68.1	727	230	73	75
Malvern Avenue and Commonwealth Avenue	40,000	67.8	689	218	69	80
Commonwealth Avenue and Orangethorpe Avenue	45,000	68.3	775	245	77	80
Orangethorpe Avenue and SR-91	46,000	68.2	793	251	79	75
Harbor Boulevard						
North of Imperial Highway	49,000	71.1	1,525	482	152	115
Imperial Highway and Bastanchury Road	49,000	71.1	1,525	482	152	95
Bastanchury Road and Brea Boulevard	47,000	70.8	1,463	463	146	100
Brea Boulevard and Berkeley Avenue	60,000	69.5	1,035	327	103	90
Berkeley Avenue and Chapman Avenue	49,000	65.5	421	133	42	80
Chapman Avenue and Commonwealth Avenue	49,000	65.5	421	133	42	75
Commonwealth Avenue and Orangethorpe Avenue	52,000	68.8	896	283	90	75
Orangethorpe Avenue and SR-91	51,000	68.6	875	278	88	75
Brea Boulevard						
North of Bastanchury Road	29,000	66.4	500	158	50	95
Bastanchury Road and Lemon Street	33,000	66.8	569	180	57	110
Lemon Street and Harbor Boulevard	22,000	65.1	379	120	38	100

Table 5.6-9 [continued]
Buildout Traffic Noise Levels

Roadway Segment	Buildout					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
State College Boulevard						
North of Bastanchury Road	29,000	66.1	500	158	50	120
Bastanchury Road and Yorba Linda Boulevard	36,000	67.1	621	196	62	110
Yorba Linda Boulevard and Nutwood Avenue	49,000	68.4	846	267	85	100
Nutwood Avenue and Chapman Avenue	41,000	68.0	707	224	71	100
Chapman Avenue and Commonwealth Avenue	36,000	67.3	621	196	62	80
Commonwealth Avenue and Orangethorpe Avenue	37,000	67.3	639	202	64	90
Orangethorpe Avenue and SR-91	41,000	67.2	707	224	71	90
Associated Road						
North of Bastanchury Road	17,000	66.7	529	167	53	80
Bastanchury Road and Yorba Linda Boulevard	25,000	68.4	777	246	78	80
Magnolia Avenue						
Commonwealth Avenue and SR-91	31,000	69.2	963	305	96	80
Brookhurst Road						
Commonwealth Avenue and Orangethorpe Avenue	33,000	68.2	774	245	77	75
Orangethorpe Avenue and SR-91	33,000	68.2	774	245	77	75
Highland Avenue						
Commonwealth Avenue and Valencia Drive	12,000	62.7	207	65	21	60
Valencia Drive and Orangethorpe Avenue	10,000	61.9	172	54	17	70
Lemon Street						
Berkeley Avenue and Chapman Avenue	17,000	62.7	210	66	21	70
Chapman Avenue and Commonwealth Avenue	21,000	63.6	260	82	26	80
Commonwealth Avenue and Orangethorpe Avenue	32,000	66.9	552	174	55	80
Orangethorpe Avenue and SR-91	46,000	68.5	794	251	79	80
Raymond Avenue						
Chapman Avenue and Commonwealth Avenue	20,000	64.9	345	109	34	65
Commonwealth Avenue and Orangethorpe Avenue	25,000	67.1	587	185	59	85
Orangethorpe Avenue and SR-91	35,000	67.2	603	191	60	90
Acacia Road						
Chapman Avenue and Commonwealth Avenue	7,000	60.2	121	38	12	85
Commonwealth Avenue and Orangethorpe Avenue	8,000	60.7	138	44	14	75
Orangethorpe Avenue and SR-91	7,000	61.5	164	52	16	75
Placentia Avenue						
SR-57 and SR-91	18,000	66.8	560	177	56	85
Berkeley Avenue						
Harbor Boulevard and Lemon Street	15,000	63.6	258	82	26	80
Lemon Street and Chapman Avenue	11,000	62.3	190	60	19	70
Pioneer Avenue						
Gilbert Street and Parks Road	4,000	57.9	69	22	7	85

Table 5.6-9 [continued]
Buildout Traffic Noise Levels

Roadway Segment	Buildout					Approximate Width of ROW (feet)
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet) [1]			
			60 CNEL Noise Contour	65 CNEL Noise Contour	70 CNEL Noise Contour	
Parks Road						
Rosecrans Avenue and Bastanchury Avenue	5,000	58.9	86	27	9	85

ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Notes:
1. Roadway noise levels and contours were calculated using the FHWA RD-77-108 model. Freeway contours were calculated using TNM 2.5. TNM 2.5 produces graphical contours and does not report distances from the centerline to each contour. Therefore, numerical values for freeway contours are not provided above.

Source: Traffic noise modeling is based on traffic data provided by Kimley Horn and Associates, July 2011.

OTHER TRANSPORTATION SOURCES

Rail Noise

Both the Union Pacific Railroad (UPRR) and Burlington Northern and Santa Fe (BNSF) (previously Atchison, Topeka and Santa Fe) railroad tracks cross the City. Amtrak's Pacific Surfliner and Southwest Chief trains, as well as the Metrolink 91 Line and Orange County Line trains use the tracks on a shared right-of-way agreement. Additionally, BNSF has freight trains traversing the City during the daytime, evening, and nighttime periods. The line supports the freight transportation needs of local industry and freight train frequency changes according to local market demand. The Fullerton Train Station is located downtown at the Fullerton Transportation Center, which also serves as a major bus depot for the Orange County Transportation Authority (OCTA).

Future plans to increase the use of the railroads or operate the railroad during nighttime hours would potentially create a significant impact. If operations of the railroads change, acoustical barriers and measures may be necessary to mitigate potential impacts to less than significant levels.

High Speed Train Noise

The California High-Speed Rail Authority (CHSRA) is currently in the process of analyzing the potential for a high speed train (HST) connecting northern and southern California. The California HST Program consists of a more than 700-mile-long high-speed train system capable of speeds in excess of 200 miles per hour on a dedicated, fully grade-separated track with state-of-the art safety, automated train control systems, and signaling.[2] The system is designed to

[2] U.S. Department of Transportation Federal Railroad Administration, *California High-Speed Train, Project-Level Environmental Impact Report/Environmental Impact Statement, Project-Level Environmental Analysis Methodologies, Version 2*, February 2009.

connect and serve the major metropolitan centers of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. The HST system is projected to carry approximately 88 to 117 million passengers annually by the year 2030.

The proposed alignment for the Los Angeles-Orange County segment will travel along the existing Los Angeles – San Diego Rail Corridor (LOSSAN) between Los Angeles Union Station and the Anaheim Regional Transportation Intermodal Center (ARTIC) in Anaheim.[3] Two Alternatives are being considered to determine if HST can operate on a shared track with other passenger trains, or if tracks dedicated only to high speed trains need to be built. For several areas a single design option has not yet been determined, as technical studies are ongoing in order to determine which options are feasible.

The CHSRA has identified the City of Fullerton as an option station on the first Southern California segment of its planned high speed train service. The CHSRA will evaluate the Fullerton Transportation Center for "skip-stop" service on the Los Angeles-to-Anaheim segment of the high speed rail project. A skip-stop reduces travel times and increases capacity by scheduling some trains to stop at the station while others continues through the station[4]. Along with other cities, Fullerton has entered into a memorandum of understanding with the authority to ensure the City will have an opportunity to evaluate options and their potential impacts before proceeding with the environmental review process.

The HST has similar noise and vibration characteristics to conventional trains with unique features resulting from the higher speed of travel. The HST is expected to be a steel-wheel, steel-rail electrically-powered train operating on its own tracks in an exclusive right-of-way. Due to no highway grade crossings, the train horn and warning bells would be eliminated except in the case of emergencies. The use of electrical power cars eliminates the rumble associated with diesel-powered locomotives. All of these factors allow HST to generate lower noise levels than conventional trains at speeds with which most people are familiar. However, at higher speeds, HST shows a noise increase over conventional trains due to aerodynamic effects. A mitigating factor is that the high speeds enable HST noise to occur for a relatively short duration (a few seconds at the highest speeds).

Vibration of the ground caused by the pass-by of the HST is similar to that caused by conventional steel wheel/steel rail trains. The same speed-dependent vibration generation mechanisms are present in each type of train. Holding down vibration levels associated with the HST are the new track construction and smooth track and wheel surfaces resulting from high maintenance standards required for high speed operation.

As previously noted, the City of Fullerton will be proactive within the planning process to ensure the option station within the City is consistent with the Community Development Plan (Refer to Exhibit 3-3, *Community Development Plan*) and The Fullerton Plan. Acoustical barriers and measures may be necessary to mitigate potential impacts to less than significant levels. Thus,

[3] U.S. Department of Transportation Federal Railroad Administration, *California High-Speed Train, Project-Level Environmental Impact Report/Environmental Impact Statement*, *Los-Angeles – Orange County – San Diego, Noise & Vibration Technical Evaluation*, January 2004.

[4] City of Fullerton, Transportation Center Website, http://www.cityoffullerton.com/visitors/downtown_fullerton/transportation_center.asp, accessed July 21, 2011.

a less than significant impact would occur with the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan would reduce these impacts to less than significant levels.

Airport Noise

The primary source of air traffic affecting noise levels within the City is the Fullerton Municipal Airport (International Air Transport Association [IATA] airport code: FUL). The Fullerton Municipal Airport is a general aviation airport located on the southwestern boundary of the City, between Artesia Avenue and West Commonwealth Avenue. The Orange County Airport Land Use Commission (ALUC) is an advisory body that ensures airport land use compatibility and reviews local agency land use actions and airport plans. In conjunction with the Airport Noise and Safety Committee and the Fullerton Airport Pilots Association (FAPA), the Fullerton Municipal Airport has been active in reducing noise from the facility. FAPA has tested and found innovative methods to lessen noise impacts on take-off by adjusting engine revolutions per minute (RPM). The airport has a Runway 6 Preferred Policy which provides take-offs over the Fullerton industrial area to the east (when winds are permitting), rather than over residential areas within the City and in neighboring cities. In addition, the Fullerton Municipal Airport restricts "pattern work" (flying in the traffic pattern to repeatedly practice take-offs and landings) after 10:00 PM, in order to minimize noise impacts to neighbors. Also, the City of Fullerton currently has an ordinance in effect which prohibits "touch and goes" between the hours of 6:00 PM and 7:00 AM on weekends and holidays (Chapter 18.03.30(28) of the Fullerton Municipal Code).

Noise exposure contours around airports are determined from the number and type of aircraft using the airport, the magnitude and duration of each fly over, flight paths, and the time of day when flights occur. The Airport Noise Standards contained in Title 4 of the *California Administrative Code* specify that airports shall not permit noise exposures of 65 dB CNEL or greater to extend into residential or school areas. The State Aeronautics Act specifies 65 dB CNEL as the criterion which airports must meet to protect existing residential communities from unacceptable exterior exposures to aircraft noise. The exterior maximum of 65 dB CNEL is given as the level deemed acceptable to a reasonable person residing in urban residential areas where houses are of typical California construction and may have windows partially open.

Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended Mitigation Measure N-5, would ensure aircraft noise impacts to residential uses within the 65 dB CNEL noise contour are mitigated to a less than significant level.

STATIONARY SOURCES

Commercial and industrial land uses are located near sensitive receptor areas. These uses currently generate occasional stationary noise impacts. Primary noise sources associated with these facilities are due to customer trips, delivery trucks, heavy machinery, air compressors, generators, outdoor loudspeakers, and gas vents. Other significant stationary noise sources within the City include construction activity, street sweepers, and gas-powered leaf blowers.

Residential Uses

Residential uses make up the single largest land use category in Fullerton, with 6,278 acres and approximately 53 percent of the total land in the City. A total of 56 percent of the residential land is single-family, while approximately 44 percent of the land contains multi-family uses. Future development of residential lots would create stationary noise typical of any new residential development. Noise that is typical of single-family residential areas includes children playing, pets, amplified music, pool and spa equipment operation, mechanical equipment, woodworking, car repair, and home repair. Noise from residential stationary sources would primarily occur during the "daytime" activity hours and result in a less than significant impact.

Commercial/Office/Industrial

Noise generally produced in commercial, office, and industrial districts includes that typically associated with slow moving truck deliveries, parking areas, landscape maintenance, and similar activities. The vast majority of the commercial/office-use is devoted to commercial uses, including commercial retail and commercial residential (mixed-uses). These land uses are most heavily concentrated along the Harbor Boulevard corridor, as well as along Orangethorpe Avenue and Euclid Street. Scattered commercial concentrations are found along Commonwealth and Chapman Avenues. The majority of office development is clustered at the intersections of Harbor and Brea Boulevard, Brookhurst Street, and Commonwealth Avenue, and south of California State University Fullerton (CSUF). Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan would reduce these impacts to less than significant levels.

Mechanical Equipment

Typical mechanical equipment associated with stationary sources includes heating, ventilation, and air conditioning units (HVAC). Actual activity levels would vary from season to season and day to day, and noise level reference data for the HVAC units are only available for high activity levels more characteristic of conditions during daytime hours on a warm summer day. Typical HVAC units would operate in unoccupied mode throughout the entire nighttime period, using a temperature threshold for cooling that is unlikely to be triggered during those hours. HVAC related noise levels would be substantially lower during the nighttime hours than during the loudest daytime hour. As discussed above, temporal variations in noise emissions from the HVAC units are expected to be complex and cannot be accurately distilled into a single diurnal pattern. It is reasonable to expect that, for at least a single daytime hour during warmer times of the year, all or nearly all of the HVAC units could be operating simultaneously and nearly continuously. New development may include HVAC units, thus adjacent sensitive uses may experience noise levels that exceed City Noise Standards. Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended Mitigation Measure N-6 would reduce these impacts to less than significant levels.

Slow-Moving Trucks (Deliveries)

In commercial areas, noise sources at loading areas may include maneuvering and idling trucks, truck refrigeration units, fork lifts, banging and clanging of equipment (i.e., hand carts and roll-up doors), noise from public address systems, and voices of truck drivers and employees. Noise sources at loading areas may include maneuvering and idling trucks, truck

refrigeration units, fork lifts, banging and clanging of equipment (i.e., hand carts and roll-up doors), noise from public address systems, and voices of truck drivers and employees. Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan would reduce these impacts to less than significant levels.

Parking Areas

Traffic associated with parking lots is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, an engine starting-up, and car passing by may be an annoyance to adjacent sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan would reduce these impacts to less than significant levels.

Landscape Maintenance

Implementation of The Fullerton Plan would introduce new landscaping requiring periodic maintenance. Noise generated by maintenance equipment such as gasoline-powered lawnmowers, leaf-blowers, or hedge edgers could be a nuisance to nearby sensitive receptors. Maintenance activities would be conducted during daytime hours for brief periods of time and would increase ambient noise levels.

In conclusion, all mobile and stationary source impacts would be reduced to less than significant levels by complying with the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended mitigation measures.

Proposed General Plan Update Policies and Actions:

P8.1 ***Noise Reduction Measures***
Support regional and subregional efforts to implement projects or programs that abate and/or attenuate noise across jurisdictions, particularly where the source is not under the City's authority.

P8.2 ***Mobile Sources***
Support projects, programs, policies and regulations to control and abate noise generated by mobile sources.

P8.3 ***Consideration of Noise in Land Use Decisions***
Support projects, programs, policies and regulations which ensure noise-compatible land use planning recognizing the relative importance of noise sources in order of community impact, the local attitudes towards these sources, and the suburban or urban characteristics of the environment, while identifying noise sensitive uses.

P8.4 ***Noise Reduction Measures***
Support projects, programs, policies and regulations to control and abate noise generated by stationary sources.

P8.5 ***Focus Area Planning***
Support projects, programs, policies and regulations to evaluate ways ensure noise-compatible land use planning as part of community-based planning of Focus Areas.

P8.6 ***Noise Receptors***
Support projects, programs, policies and regulations to permit uses where the noise level of the surroundings—after taking into account noise insulation features and other control techniques of the use—is not detrimental to the use.

P8.7 ***Noise Generators***
Support projects, programs, policies and regulations to permit uses and/or activities where the noise generated by the use and/or activity is not detrimental or otherwise a nuisance to the surroundings.

A8.1 ***Noise Ordinance***
Update the City's Noise Ordinance to comply with the policies of The Fullerton Plan and to address noise issues in the community.

Mitigation Measures:

N-5 Residential projects located within the 65 dB CNEL noise contour for the Fullerton Municipal Airport shall be subject to review by the Orange County Airport Land Use Commission and shall be required to ensure interior noise levels from aircraft operations are at or below 45 dB CNEL.

N-6 The City shall require mechanical equipment from future development to be placed as far practicable from sensitive receptors. Additionally, the following shall be considered prior to HVAC installation: proper selection and sizing of equipment, installation of equipment with proper acoustical shielding, and incorporating the use of parapets into the building design.

Level of Significance After Mitigation: Less Than Significant Impact.

5.6.6 CUMULATIVE IMPACTS

CUMULATIVE SHORT-TERM CONSTRUCTION NOISE

- **CUMULATIVE SHORT-TERM CONSTRUCTION NOISE AS A RESULT OF IMPLEMENTATION OF THE FULLERTON PLAN COULD RESULT IN CUMULATIVELY CONSIDERABLE IMPACTS.**

Impact Analysis: The City of Fullerton is 90 percent built out, and very few vacant parcels are located throughout the City that would experience construction activity. However, it is anticipated that the City would experience construction activity associated with redevelopment of existing developed sites as well as new construction on undeveloped sites. It is unlikely the City would experience intensive construction activity with implementation of The Fullerton Plan. Short-term construction noise is a localized activity and would affect only land uses that are

immediately adjacent to a specific project site. It is likely that each construction project would have to comply with the local noise ordinance, as well as mitigation measures that may be prescribed pursuant to CEQA provisions that require significant impacts to be reduced to the extent feasible. In addition, it is unlikely that all construction projects would occur simultaneously within the City. Thus, a less than significant impact would occur.

Proposed General Plan Update Policies and Actions: Refer to the Policies and Actions cited above.

Mitigation Measures: Refer to Mitigation Measures N-1 through N-4. No additional mitigation measures are required.

Level of Significance After Mitigation: Less Than Significant Impact.

CUMULATIVE LONG-TERM OPERATIONAL IMPACTS

- **CUMULATIVE LONG-TERM OPERATIONAL NOISE AS A RESULT OF IMPLEMENTATION OF THE FULLERTON PLAN COULD RESULT IN CUMULATIVELY CONSIDERABLE IMPACTS.**

Impact Analysis: Cumulative impacts are based upon assumptions made within Appendix E, Noise Data, and Section 5.4, Traffic and Circulation, to address noise impacts within the City of Fullerton. Cumulative stationary noise sources would generally be less than significant with the implementation of the policies outlined in The Fullerton Plan. However, as traffic noise tends to dominate the noise environment within the City of Fullerton, the analysis below considers whether the increase in traffic noise would be noticeable and significant per the criteria.

MOBILE SOURCES

Table 5.6-10, *Cumulative Exterior Noise Adjacent to Nearby Roadways*, compares the "Existing" scenario to the "General Plan Buildout" scenario and outlines the anticipated noise level changes adjacent to specific roadways in the City as a direct result of implementation of The Fullerton Plan. The change in traffic patterns is due to the redistribution of traffic on City streets due to the change in land uses based upon the General Plan Land Use Diagram. It should be noted that as ambient noise levels increase, a smaller degree of change in noise levels is required to elicit significant annoyance; refer to the significance criteria listed in Table 5.6-7. Existing noise levels below 60 dBA would require an increase of 5 dBA or more to be significant, while existing noise levels that are 60 dBA or above would require an increase of 3 dBA or more to be significant. As indicated in Table 5.6-10, buildout of The Fullerton Plan would generate an audible noise level increase along Gilbert Street north of Rosecrans Avenue and Associated Road between Bastanchury Road and Yorba Linda Boulevard, thus creating a significant impact.

Table 5.6-10
Cumulative Exterior Noise Adjacent to Nearby Roadways

Roadway Segment[1]	Existing		Buildout		Difference in dBA @ 100 feet from Roadway	Potentially Significant Impact?[2]
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline		
Imperial Highway						
Harbor Boulevard and Palm Street	47,000	71.0	52,000	71.4	0.4	*No*
Rosecrans Ave						
West of Gilbert Street	20,000	67.3	27,000	68.6	1.3	*No*
Gilbert Street and Parks Road	14,000	65.7	18,000	66.8	1.1	*No*
Parks Road and Euclid Street	16,000	66.3	20,000	67.3	1.0	*No*
Bastanchury Road						
Malvern Avenue and Parks Road	15,000	67.3	18,000	68.0	0.7	*No*
Parks Road and Euclid Street	15,000	67.2	21,000	68.6	1.4	*No*
Euclid Street and Harbor Boulevard	31,000	70.2	40,000	71.3	1.1	*No*
Harbor Boulevard and Brea Boulevard	37,000	68.6	41,000	69.0	0.4	*No*
Brea Boulevard and State College Boulevard	38,000	71.1	44,000	71.7	0.6	*No*
State College Boulevard and SR-57	24,000	67.9	32,000	69.2	1.3	*No*
Malvern Avenue						
West of Burning Tree Road	23,000	67.0	39,000	69.3	2.3	*No*
Burning Tree Road and Gilbert Street	20,000	66.0	34,000	68.3	2.3	*No*
Gilbert Street and Bastanchury Road	32,000	67.9	40,000	68.9	1.0	*No*
Bastanchury Road and Euclid Street	23,000	66.5	29,000	67.8	1.3	*No*
Euclid Street and Woods Avenue	23,000	66.7	30,000	67.9	1.2	*No*
Chapman Avenue						
Woods Avenue and Harbor Boulevard	23,000	66.7	28,000	67.5	0.8	*No*
Harbor Boulevard and Berkeley Avenue	23,000	66.7	31,000	68.0	1.3	*No*
Berkeley Avenue and Acacia Avenue	34,000	68.4	40,000	69.1	0.7	*No*
Acacia Avenue and State College Boulevard	36,000	68.7	47,000	69.8	1.1	*No*
State College Blvd and SR-57	31,000	67.9	53,000	70.2	2.3	*No*
Commonwealth Avenue						
West of Magnolia Avenue	14,000	64.4	24,000	66.7	2.3	*No*
Magnolia Avenue and Gilbert Street	23,000	66.8	33,000	68.4	1.6	*No*
Gilbert Street and Basque Avenue	20,000	66.2	28,000	67.5	1.3	*No*
Basque Avenue and Euclid Street	15,000	63.6	22,000	65.3	1.7	*No*
Euclid Street and Harbor Boulevard	19,000	64.6	31,000	66.7	2.1	*No*
Harbor Boulevard and Raymond Avenue	21,000	64.9	35,000	67.1	2.2	*No*
Raymond Avenue and Acacia Avenue	16,000	65.2	26,000	67.4	2.2	*No*
Acacia Avenue and State College Boulevard	13,000	64.2	21,000	66.3	2.1	*No*
State College Blvd and Nutwood Avenue	8,000	62.1	14,000	64.6	2.5	*No*
Whitaker Street						
West of Magnolia Avenue	7,000	60.4	10,000	61.9	1.5	*No*

Table 5.6-10 [continued]
Cumulative Exterior Noise Adjacent to Nearby Roadways

Roadway Segment[1]	Existing		Buildout		Difference in dBA @ 100 feet from Roadway	Potentially Significant Impact?[2]
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline		
Valencia Drive						
Magnolia Avenue and Brookhurst Road	7,000	61.7	10,000	63.2	1.5	*No*
Brookhurst Road and Euclid Avenue	8,000	60.9	12,000	62.7	1.8	*No*
Euclid Avenue and Highland Avenue	7,000	60.2	12,000	62.5	2.3	*No*
Highland Avenue and Harbor Boulevard	5,000	58.7	11,000	62.1	3.4	*No*
Harbor Boulevard and Lemon Street	5,000	58.7	11,000	62.1	3.4	*No*
East of Lemon Street	6,000	59.5	13,000	62.8	3.3	*No*
Orangethorpe Avenue						
Magnolia Avenue and Gilbert Street	25,000	68.2	30,000	69.0	0.8	*No*
Gilbert Street and Brookhurst Road	17,000	66.5	26,000	68.3	1.8	*No*
Brookhurst Road and Euclid Avenue	21,000	67.5	29,000	68.9	1.4	*No*
Euclid Avenue and Harbor Boulevard	23,000	67.7	35,000	69.5	1.8	*No*
Harbor Boulevard and Raymond Avenue	30,000	68.9	36,000	69.7	0.8	*No*
Raymond Avenue and State College Boulevard	28,000	67.4	36,000	68.5	1.1	*No*
State College Boulevard and Placentia Avenue	27,000	67.2	36,000	68.4	1.2	*No*
Placentia Avenue and SR-57	31,000	67.8	40,000	68.9	1.1	*No*
Gilbert Street						
North of Rosecrans Avenue	13,000	65.2	28,000	68.6	3.4	*Yes*
Rosecrans Avenue and Malvern Avenue	21,000	64.9	34,000	67.0	2.1	*No*
Malvern Avenue and Commonwealth Avenue	33,000	66.9	39,000	67.6	0.7	*No*
Euclid Avenue						
North of Rosecrans Avenue	21,000	68.8	29,000	70.2	1.4	*No*
Rosecrans Avenue and Bastanchury Avenue	32,000	70.6	37,000	71.2	0.6	*No*
Bastanchury Road and Malvern Avenue	28,000	67.6	31,000	68.1	0.5	*No*
Malvern Avenue and Commonwealth Avenue	34,000	67.1	40,000	67.8	0.7	*No*
Commonwealth Ave and Orangethorpe Ave	38,000	67.6	45,000	68.3	0.7	*No*
Orangethorpe Avenue and SR-91	48,000	68.4	46,000	68.2	-0.2	*No*
Harbor Boulevard						
North of Imperial Highway	37,000	69.9	49,000	71.1	1.2	*No*
Imperial Highway and Bastanchury Road	37,000	69.9	49,000	71.1	1.2	*No*
Bastanchury Road and Brea Boulevard	32,000	69.1	47,000	70.8	1.7	*No*
Brea Boulevard and Berkeley Avenue	40,000	67.7	60,000	69.5	1.8	*No*
Berkeley Avenue and Chapman Avenue	36,000	64.1	49,000	65.5	1.4	*No*
Chapman Avenue and Commonwealth Avenue	36,000	64.1	49,000	65.5	1.4	*No*
Commonwealth Ave and Orangethorpe Ave	38,000	67.4	52,000	68.8	1.4	*No*
Orangethorpe Avenue and SR-91	48,000	68.4	51,000	68.6	0.2	*No*
Brea Boulevard						
North of Bastanchury Road	26,000	65.9	29,000	66.4	0.5	*No*
Bastanchury Road and Lemon Street	24,000	65.5	33,000	66.8	1.3	*No*
Lemon Street and Harbor Boulevard	18,000	64.3	22,000	65.1	0.8	*No*

Table 5.6-10 [continued]
Cumulative Exterior Noise Adjacent to Nearby Roadways

Roadway Segment[1]	Existing		Buildout		Difference in dBA @ 100 feet from Roadway	Potentially Significant Impact?[2]
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline		
State College Boulevard						
North of Bastanchury Road	25,000	65.5	29,000	66.1	0.6	*No*
Bastanchury Road and Yorba Linda Boulevard	27,000	65.8	36,000	67.1	1.3	*No*
Yorba Linda Boulevard and Nutwood Avenue	35,000	67.0	49,000	68.4	1.4	*No*
Nutwood Avenue and Chapman Avenue	36,000	67.4	41,000	68.0	0.6	*No*
Chapman Avenue and Commonwealth Avenue	21,000	65.0	36,000	67.3	2.3	*No*
Commonwealth Ave and Orangethorpe Ave	23,000	65.2	37,000	67.3	2.1	*No*
Orangethorpe Avenue and SR-91	30,000	65.9	41,000	67.2	1.3	*No*
Associated Road						
North of Bastanchury Road	10,000	64.4	17,000	66.7	2.3	*No*
Bastanchury Road and Yorba Linda Boulevard	10,000	64.4	25,000	68.4	4.0	*Yes*
Magnolia Avenue						
Commonwealth Avenue and SR-91	24,000	68.1	31,000	69.2	1.1	*No*
Brookhurst Road						
Commonwealth Ave and Orangethorpe Ave	24,000	66.8	33,000	68.2	1.4	*No*
Orangethorpe Avenue and SR-91	35,000	68.5	33,000	68.2	-0.3	*No*
Highland Avenue						
Commonwealth Avenue and Valencia Drive	10,000	61.9	12,000	62.7	0.8	*No*
Valencia Drive and Orangethorpe Avenue	8,000	60.9	10,000	61.9	1.0	*No*
Lemon Street						
Berkeley Avenue and Chapman Avenue	14,000	61.9	17,000	62.7	0.8	*No*
Chapman Avenue and Commonwealth Avenue	20,000	63.4	21,000	63.6	0.2	*No*
Commonwealth Ave and Orangethorpe Ave	29,000	66.5	32,000	66.9	0.4	*No*
Orangethorpe Avenue and SR-91	37,000	67.5	46,000	68.5	1.0	*No*
Raymond Avenue						
Chapman Avenue and Commonwealth Avenue	14,000	63.3	20,000	64.9	1.6	*No*
Commonwealth Ave and Orangethorpe Ave	21,000	66.3	25,000	67.1	0.8	*No*
Orangethorpe Avenue and SR-91	29,000	66.4	35,000	67.2	0.8	*No*
Acacia Road						
Chapman Avenue and Commonwealth Avenue	6,000	59.5	7,000	60.2	0.7	*No*
Commonwealth Ave and Orangethorpe Ave	7,000	60.1	8,000	60.7	0.6	*No*
Orangethorpe Avenue and SR-91	6,000	60.8	7,000	61.5	0.7	*No*
Placentia Avenue						
SR-57 and SR-91	14,000	65.7	18,000	66.8	1.1	*No*
Berkeley Avenue						
Harbor Boulevard and Lemon Street	13,000	63.0	15,000	63.6	0.6	*No*
Lemon Street and Chapman Avenue	14,000	63.3	11,000	62.3	1.0	*No*
Pioneer Avenue						
Gilbert Street and Parks Road	5,000	58.9	4,000	57.9	1.0	*No*

Table 5.6-10 [continued]
Cumulative Exterior Noise Adjacent to Nearby Roadways

Roadway Segment[1]	Existing		Buildout		Difference in dBA @ 100 feet from Roadway	Potentially Significant Impact?[2]
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline		
Parks Road						
Rosecrans Avenue and Bastanchury Avenue	5,000	58.9	5,000	58.9	0	*No*

ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Notes:
1. Roadway noise levels and contours were calculated using the FHWA RD-77-108 model. Freeway contours were calculated using TNM 2.5. TNM 2.5 produces graphical contours and does not report distances from the centerline to each contour. Therefore, numerical values for freeway contours are not provided above.
2. Existing noise levels below 60 dBA would require an increase of 5 dBA or more to be significant, while existing noise levels that are 60 dBA or above would require an increase of 3 dBA or more to be significant.

Source: Traffic noise modeling is based on traffic data provided by Kimley Horn and Associates, June 2009 and July 2011.

Compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended mitigation measures would not reduce the generated audible noise levels to a less than significant level. Therefore, a significant and unavoidable impact would occur.

STATIONARY SOURCES

Noise caused by stationary sources would not substantially increase with implementation of The Fullerton Plan as the City is generally built out. Through implementation of The Fullerton Plan, it is anticipated that there would be few new stationary sources. Therefore, a less than significant impact would occur in regards to cumulative stationary noise exposure.

Proposed General Plan Update Policies and Actions: Refer to the Policies and Actions cited above.

Mitigation Measures: Refer to Mitigation Measures N-5 and N-6. No additional mitigation measures are available.

Level of Significance After Mitigation: Significant Unavoidable Impact.

5.6.7 SIGNIFICANT UNAVOIDABLE IMPACTS

Despite compliance with objectives, policies, implementation actions and mitigation measures, The Fullerton Plan would result in significant and unavoidable impacts regarding the following:

- ***Cumulative Long-Term Operational Noise.*** The change in traffic patterns is due to the redistribution of traffic on City streets due to the change in land uses and anticipated City growth. Buildout of The Fullerton Plan would generate an audible noise level increase

along Gilbert Street north of Rosecrans Avenue and Associated Road between Bastanchury Road and Yorba Linda Boulevard. Thus, cumulative long-term operational noise impacts would be significant and unavoidable.

All other impacts related to noise associated with compliance and/or adherence to the City's Noise Ordinance, goals, policies, and actions in The Fullerton Plan, and recommended mitigation measures.

If the City of Fullerton approves The Fullerton Plan, the City shall be required to cite their findings in accordance with *CEQA Guidelines* Section 15091 and prepare a Statement of Overriding Considerations in accordance with *CEQA Guidelines* Section 15093.

5.6.8 SOURCES CITED

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