4.10 Noise

The following analysis is summarized from a noise study prepared by Mestre Greve Associates in December 2001 which is contained in its entirety as Appendix K. Please refer to Appendix K for a more detailed description of study methodology and glossary of terms.

4.10.1 ENVIRONMENTAL SETTING

Sound is technically 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). 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 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

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. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Exhibit 4-44 provides examples of various noises and their typical A-weighted noise level.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

Exhibit 4-44 Typical A-Weighted Noise Levels

HEARING LOSS is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy urban environs, are not sufficiently loud to cause hearing loss.

SPEECH INTERFERENCE is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

SLEEP INTERFERENCE is a major noise concern for traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

PHYSIOLOGICAL RESPONSES are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are sign of harm.

ANNOYANCE is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability.

Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-Weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or perhaps a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 or 24-hours for community noise problems. For this type of analysis, cumulative noise metrics will be used.

Several rating scales have been developed for measurement of community noise. These account for: (1) the parameters of noise that have been shown to contribute to the effects of noise on man, (2) the

variety of noises found in the environment, (3) the variations in noise levels that occur as a person moves through the environment, and (4) the variations associated with the time of day. They are designed to account for the known health effects of noise on people described previously. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the predominate noise scales are the: Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

LEQ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. LEQ is the "energy" average noise level during the time period of the sample. LEQ can be measured for any time period, but is typically measured for 1 hour. This 1 hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.

CNEL, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or simply "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are presented in Exhibit 4-45.

Ldn, the day-night scale is similar to the CNEL scale except that evening noises are not penalized. It is a measure of the overall noise experienced during an entire day. The time-weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. In the Ldn scale, those noise levels that occur during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, where home and sleep is the most probable activity.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example since 5 minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a twenty minute measurement period. It is L(%) that is used for most Noise Ordinance standards. For example most daytime City, state and county Noise Ordinances use an ordinance standard of 55 dBA for

Exhibit 4-45 Typical Outdoor Noise Levels

30 minutes per hour or an L(50) level of 55 dBA. In other words the Noise Ordinance states that no noise level should exceed 55 dBA for more that fifty percent of a given period.

Noise Criteria

City of Irvine Noise Element

Table F-1 of the City of Irvine Noise Element of the General Plan defines indoor and outdoor noise standards for various land use categories. This table is recreated in Exhibit 4-46. The 65 CNEL outdoor noise standard is applicable to all residential uses, schools and parks. Note that the outdoor standard is only applicable to picnic areas of the parks. The indoor noise standards applicable to the project are the 45 CNEL standard for residential and school uses, the 50 CNEL standard for office uses, the 55 CNEL standard for retail uses and the 65 CNEL standard for manufacturing, warehousing and wholesale uses.

City of Irvine Noise Ordinance

Title 6, Division 8, Chapter 2 of the City of Irvine Municipal Code contains the City of Irvine Noise Ordinance. The Noise Ordinance is designed to control unnecessary, excessive and annoying sounds from sources on private property by setting limits that cannot be exceeded at adjacent properties. The noise ordinance requirements can not be applied to mobile noise sources such as heavy trucks when traveling on public roadways. Control of the mobile noise sources on public roads is preempted by federal and State laws. However, the noise ordinance does apply to vehicles while they are on private property.

The Noise Ordinance specifies noise levels that cannot be exceeded at adjacent properties for a specified period of time. Both interior and exterior noise level limits are specified for four noise zones. The applicable Noise Zone is based on the land use being exposed to the noise. Noise Zone 1 includes all hospitals, libraries, churches, schools and residential properties. Noise Zone 2 includes all professional office and public institutional properties. Noise Zone 3 includes all commercial properties excluding professional office properties. Noise Zone 4 includes all industrial properties. The noise levels limits contained in the noise ordinance are presented in Table 4-44 for each of these zones. Exterior noise level limits for each of the zones are presented first and then the interior noise level limits are presented. The interior noise level limits for Noise Zones 2, 3 and 4 are the same.

The first column of Table 4-44 presents maximum amount of time in a one hour period that the noise level shown in Columns 3 and 4 can be exceeded. Column 2 lists the equivalent noise metric in terms of "percent noise level" or L% (The L% metric is described in the Section entitled Temporary Impacts). Columns 3 and 4 list the daytime and nighttime noise levels that cannot be exceeded for the time specified in the first column.

Exhibit 4-46 City of Irvine Noise Standards

Table 4-44 City of Irvine Noise Ordinance Standards			
Maximum Time of Exposure	**Noise Metric**	**Noise Level Not to be Exceeded**	
		7 a.m. to 10 p.m. (daytime)	**10 p.m. to 7 a.m. (nighttime)**
NOISE ZONE 1 EXTERIOR NOISE STANDARDS			
30 Minutes/Hour	L50	55 dBA	50 dBA
15 Minutes/Hour	L25	60 dBA	55 dBA
5 Minutes/Hour	L8.3	65 dBA	60 dBA
1 Minute/Hour	L1.7	70 dBA	65 dBA
Any period of time	Lmax	75 dBA	70 dBA
NOISE ZONE 2 EXTERIOR NOISE STANDARDS			
30 Minutes/Hour	L50	55 dBA	55 dBA
15 Minutes/Hour	L25	60 dBA	60 dBA
5 Minutes/Hour	L8.3	65 dBA	65 dBA
1 Minute/Hour	L1.7	70 dBA	70 dBA
Any period of time	Lmax	75 dBA	75 dBA
NOISE ZONE 3 EXTERIOR NOISE STANDARDS			
30 Minutes/Hour	L50	60 dBA	60 dBA
15 Minutes/Hour	L25	65 dBA	65 dBA
5 Minutes/Hour	L8.3	70 dBA	70 dBA
1 Minute/Hour	L1.7	75 dBA	75 dBA
Any period of time	Lmax	80 dBA	80 dBA
NOISE ZONE 4 EXTERIOR NOISE STANDARDS			
30 Minutes/Hour	L50	70 dBA	70 dBA
15 Minutes/Hour	L25	75 dBA	75 dBA
5 Minutes/Hour	L8.3	80 dBA	80 dBA
1 Minute/Hour	L1.7	85 dBA	85 dBA
Any period of time	Lmax	90 dBA	90 dBA

Table 4-44 City of Irvine Noise Ordinance Standards			
NOISE ZONE 1 INTERIOR NOISE STANDARDS			
5 Minutes/Hour	L8.5	55 dBA	45 dBA
1 Minutes/Hour	L1.7	60 dBA	50 dBA
Any period of Time	Lmax	65 dBA	55 dBA
NOISE ZONE 2, 3, & 4 INTERIOR NOISE STANDARDS			
5 Minutes/Hour	L8.5	55 dBA	55 dBA
1 Minutes/Hour	L1.7	60 dBA	60 dBA
Any period of Time	Lmax	65 dBA	65 dBA
Noise Zone 1: All hospitals, libraries, churches, schools, and residential properties. Noise Zone 2: All professional office and public institutional properties. Noise Zone 3: All commercial properties excluding professional office properties. Noise Zone 4: All industrial properties.			

For example, for Noise Zone 1, a noise level of 55 dBA cannot be exceeded for more than 30 minutes in an hour during the daytime. A noise level of 60 dBA cannot be exceeded for more than 15 minutes in an hour, 65 dBA cannot be exceeded for more than 5 minutes in an hour, 70 dBA cannot be exceed for more than 1 minute in an hour and 75 dBA cannot be exceeded at anytime. During the nighttime, these limits are reduced by 5 dB for Noise Zone 1. The daytime and nighttime noise level limits are the same for Noise Zones 2, 3 and 4.

City of Irvine Noise Ordinance Standards

Noise Ordinance violation issues are typically of concern where commercial uses directly abut residential uses. For this project, this occurs in four potential locations where potential retail sites may be located directly abutting residential areas. These potential retail sites are located at the northwest corner of Sand Canyon and Trabuco, the southwest corner of Sand Canyon and Irvine, south of Portola parkway and in the southwest corner of Portola Parkway and SR-241. Additionally there are Research/Industrial uses proposed immediately south of residential uses on the east side of the project between Portola Parkway and Irvine Boulevard.

Existing Noise Levels

Ambient Noise Measurements

Ambient noise measurements were made along roadways where the project is projected to cause a significant noise increase (see Section entitled Long Term Off-Site Impacts). Fifteen-minute measurements were made at each site. Traffic counts were also made during the measurements. This allowed computer modeling of the traffic noise levels under the same conditions as the measurements. The measured and modeled noise levels can then be compared and the accuracy of the model verified.

Noise measurements were made during the afternoon of August 31, 2001. The measurements were made utilizing a Br^{n}el and Kj£r 2236 Sound Level Meter. This meter satisfies ANSI Type 1 specifications for sound measurement equipment which is the highest accuracy specification. The meter is checked and certified annually to ensure it remains within specifications. The meter was calibrated with an acoustical calibrator before and after the measurements. The acoustical calibrator is calibrated annually with calibration traceable to the National Institute of Standards and Technology.

Table 4-45 presents the results of the measurements. A site number, short description of the location and the start time of the measurements are presented in the first three columns of the table. The next three columns present the measured Leq, maximum (Lmax) and minimum (Lmin) noise levels.

Table 4-45
Ambient Noise Measurement Results

Site	Location	Start	Leq	Lmax	Lmin
1	Along Irvine Blvd. 81 ft. from CL east of Jeffrey	2:08 PM	68	79	45
2	Along Jeffrey 78 ft. from CL south of Irvine Blvd.	3:11 PM	67	82	45
3	Along 5210 Trabuco 85 ft. from CL	4:10 PM	58	72	48
4	Along Bryan 63 ft. from CL near Trabuco and Duane	4:53 PM	63	75	44
5	Along Portola Pkwy. 96 ft. from CL west of Jeffrey	5:33 PM	59	73	39

CL – Roadway Centerline

Site 1 was located along Irvine Boulevard in the field north of the road and east of Jeffrey. Site 2 was located along the east side of Jeffrey in the field approximately 1000 feet south of Irvine Boulevard. Site 3 was located on the south side of Trabuco Road in the landscaping between the road and the parking lot of The Jesus Church at 5210 Trabuco. Site 4 was located on the south side

of Bryan in the field across Trabuco from the intersection of Duane street west of Jeffrey Road. Site 5 was located on the south side of Portola Parkway near the bicycle trail underpass west of Jeffrey Road.

For the most part, the measurements show noise levels that would typically be expected along each of the roadways. The noise level along Portola is lower than one would expect along a six lane divided roadway. Development not associated with this project is just taking place in this area and noise is projected to increase significantly over existing conditions due to the additional traffic this development will bring. Heavy trucks or single loud cars typically caused maximum noise levels at all sites.

Traffic noise modeling was performed using the traffic counts made during the measurements. To verify accuracy the modeled and measured noise levels were compared. Excellent agreement was found for all of the sites except 1 and 5. At Site 1 along Irvine Boulevard it was found that the model predicted too low of a noise level using the posted 50 mph speed limit. Therefore, the model was adjusted to assume a speed at 55 mph, which resulted in excellent agreement. A speed of 55 mph was used for all subsequent noise modeling along Irvine Boulevard presented in this report. At Site 5 the noise model predicted a much higher noise level than was measured. The relatively low traffic volume during the measurement is partly responsible for this. This difference resulted primarily due to majority of traffic traveling in the far lanes rather than the near lanes. Over a longer period this would even out. Because the model predicted a higher noise level than the measured level, no adjustments were made.

Existing Traffic Noise Levels

Existing roadway traffic noise levels in terms of CNEL were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The CALVENO noise emission curves developed by Caltrans were used with the FHWA model. These curves better model the California vehicle mix. The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used.

Table 4-46 presents the existing traffic CNEL noise levels along roadway segments that are projected to experience a 0.5 dB or greater noise level increase due to the project. The CNEL level at a distance of 100 feet from the roadway centerline is presented along with the distances, from the centerline, to the 60, 65 and 70 CNEL contours. The values given in Table 4-46 represent existing modeled noise levels and do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels. Areas with noise barriers or structures that break line of sight from a receptor to the roadway will experience lower levels.

Table 4-46
Existing Traffic CNEL Noise Levels

Roadway & Segment	CNEL @ 100 feet[1]	Distance to Contour[1]		
		70 CNEL	65 CNEL	60 CNEL
Yale Av.				
Irvine to Bryan	61.9	29	62	133
Bryan to Trabuco	62.9	34	73	156
Trabuco to Walnut	62.8	33	72	155
Jeffrey Rd.				
South of Portola	62.8	33	71	153
North of Irvine	62.8	33	71	153
Irvine to Bryan	65.6	51	110	236
Bryan to Trabuco	65.7	52	112	241
South of Trabuco	67.7	70	151	325
North of I-5	67.7	70	151	325
I-5 to Irvine Center Dr.	68.4	78	167	361
Irvine Center Dr. to Barranca	69.4	92	198	426
Sand Canyon Av.				
South of Portola	62.5	32	68	147
North of Irvine	62.5	32	68	147
South of Irvine	64.7	44	96	206
North of Trabuco	64.7	44	96	206
Trabuco to Roosevelt	65.7	51	111	239
Roosevelt to Road "B"	65.1	47	101	218
Road "B" to I-5	65.7	51	111	239
I-5 to Oak Canyon	67.0	63	136	293
Oak Canyon to Irvine Center Dr.	66.2	56	120	260
Irvine Center Dr. to Barranca	66.3	56	121	261
Alton Pkwy.				
South of Portola	61.1	25	55	118
Portola Pkwy.				
Culver to Yale	61.6	27	59	127
Yale to Jeffrey	61.8	28	61	132
Jeffrey to Sand Canyon	61.6	28	60	128
Sand Canyon to SR-133	65.5	50	108	233
SR-133 to Research	65.5	50	108	233
Research to Millennium	65.5	50	108	233
East of Millennium	65.5	50	108	233
South of SR-241	62.5	32	68	147
Irvine Bl.				
East of SR-261	67.1	64	137	296
West of Culver	67.1	64	137	296
Culver to Yale	66.5	58	126	271

1. From Roadway Centerline
RW – Contour Falls Within Right of Way

Table 4-46
Existing Traffic CNEL Noise Levels

Roadway & Segment	CNEL @ 100 feet[1]	Distance to Contour[1]		
		70 CNEL	65 CNEL	60 CNEL
East of Yale	65.5	50	107	231
West of Jeffrey	65.5	50	107	231
East of Jeffrey	65.0	46	100	216
West of Sand Canyon	65.0	46	100	216
Sand Canyon to SR-133	65.9	54	115	249
SR-133 to Research	66.0	54	117	252
Research to Central Park W.	66.0	54	117	252
Central Park W. to Millennium	66.0	54	117	252
Millennium to Connector	65.6	51	110	236
Connector to Central Park E.	65.6	51	110	236
Central Park E. to Trabuco	65.6	51	110	236
Trabuco to Alton	65.6	51	110	236
Bryan Av.				
Yale to Jeffrey	60.4	23	49	106
Trabuco Rd.				
West of Yale	64.2	41	89	191
Yale to Jeffrey	58.1	16	35	74
Jeffrey to Road "A"	56.3	12	26	56
Road "A" to Collector St.	57.4	14	31	67
Collector St. to Road "C"	57.4	14	31	67
Road "C" Sand Canyon	56.3	12	26	56
SR-133				
Trabuco to I-5	73.3	165	356	766

1. From Roadway Centerline
RW – Contour Falls Within Right of Way

Table 4-46 shows that most of the existing roadways with noise levels that will be affected by the project generate considerable amounts of noise currently. Jeffrey Road north of Irvine, Alton Parkway, Portola Parkway between Culver and Sand Canyon, Bryan Avenue, and Trabuco Road from Yale to Sand Canyon generate moderate levels of noise. Yale Avenue, Jeffrey from Irvine to I-5, Sand Canyon, Portola East of Sand Canyon, Irvine Boulevard and Trabuco west of Yale generate substantial levels of noise. Jeffrey south of I-5 generates significant levels of noise and SR-133 generates high levels of noise. Most of the existing residential uses along these roadways have noise barriers that reduce existing traffic noise levels to below the City's 65 CNEL standard.

4.10.2 ENVIRONMENTAL IMPACTS

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on noise if it results in any of the following:

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

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

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

- 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, would the project expose people residing or working in the project area to excessive noise levels.

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

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

The Initial Study determined that since there are no private airstrips in the vicinity of the project, this issue would not be analyzed in the Draft EIR.

Potential noise impacts are commonly divided into two groups; temporary and long term. Temporary impacts are usually associated with noise generated by construction activities. Long-term impacts are further divided into impacts on surrounding land uses generated by the proposed project and those impacts that occur at the proposed project site.

Noise Impact Criteria

Off-site impacts from on-site activities, temporary and long-term, are measured against the City of Irvine Noise Ordinance presented previously. Any noise generated on the project site must comply with the Noise Ordinance.

Long-term off-site impacts from traffic noise are measured against two criteria. Both criteria must be met for a significant impact to be identified. First, project traffic must cause a significant noise level increase on a roadway segment adjacent to a noise sensitive land use. Second the resulting future with project noise level must exceed the criteria level for the noise sensitive land use. In this case the criteria level is 65 CNEL for residential land uses.

In community noise assessment, changes in noise levels greater than 3 dB are often identified as significant, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. Note that there is no scientific evidence available to support the use of 3 dB as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB appears to be appropriate for most people. In this case, many residential areas adjacent to roadways in the project vicinity are projected to have future noise levels approaching the 65 CNEL standard. Therefore, for this project, a 1 dB traffic noise level increase due to the project is considered significant.

Cumulative impacts are measured in terms of the total noise increase due to the project and other growth in the area over existing conditions. Because increases over existing conditions will take place over a long period of time, a 3 dB increase over existing conditions will be considered cumulatively significant.

Long-term on-site impacts are measured against the noise level limits applied by the City of Irvine. For residential land uses and schools, the exterior noise standard is 65 CNEL and the interior noise standard is 45 CNEL. For parks the exterior noise standard at picnic areas is 65 CNEL. For commercial areas the applicable interior noise standards are 50 CNEL for offices, 55 CNEL for retail uses, and 65 CNEL for manufacturing, warehousing and wholesale uses.

City noise standards also specify a 45 dB CNEL interior noise level for all residential occupancies. The presumed structural noise attenuation capability of a residence is 10 dB with open windows, and 20 dB with windows facing the noise source (roadway) closed. Supplemental ventilation is necessary if window closure is a needed condition to attain the 45 dB interior standard. Generally, if the exterior noise level is less than 65 dB CNEL, and the home has air conditioning or other ventilation options, then the 45 dB interior standard is automatically met. This conclusion may not be valid for multiple story dwellings. The downstairs backyard may be protected by a noise wall and have a sub-65 dB CNEL exposure. The upstairs facade, however, may have a direct line of sight to the street not protected by any barrier. The upstairs facade exposure may exceed 65 dB by a substantial amount. "Normal" structural attendance may be inadequate to attain a 45 dB CNEL interior level. Enhanced structural noise protection (generally dual-paned windows) may be necessary upstairs even if no downstairs noise upgrades are necessary.

Project Noise Impacts

Temporary or Periodic Noise Impacts (Construction)

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. For the proposed project, the highest noise levels will be generated by heavy equipment during grading.

Worst-case examples of construction noise at 50 feet are presented in Exhibit 4-47. The peak noise level for most of the equipment that will be used during the construction is 70 to 95 dBA at a distance of 50 feet. At 200 feet, the peak construction noise levels range from 58 to 83 dBA. At 400 feet the peak noise levels range from 52 to 77 dBA. Note that these noise levels are based upon worst-case conditions. Typically, noise levels near the site will be less. Noise measurements made by Mestre Greve Associates for other projects show that the noise levels generated by commonly used grading equipment (i.e. loaders, graders and trucks) generate noise levels that typically do not exceed the middle of the range shown in Exhibit 4-47.

The greatest potential for noise impacts during construction occurs where construction will occur directly adjacent to residential areas. This will occur on the west side of the project between Trabuco and Bryan and between Irvine and Portola. Noise levels could reach very high levels for short periods of time as heavy grading equipment traveled directly adjacent to the residences. The noise levels could exceed 100 dBA for very short periods of time as heavy equipment travels directly adjacent to the homes. As the equipment travels away from these homes the noise level will drop from the extreme maximum relatively quickly. Because these areas are currently being used as agricultural uses and are relatively flat a great deal of grading is not expected and grading adjacent to the residences should occur for a relatively short duration.

The City of Irvine Noise Ordinance exempts construction activities from the noise level limits during specific hours of the day. Noise generating construction activities are permitted during the hours between 7 a.m. and 7 p.m. Monday through Friday 9 a.m. to 6 p.m. on Saturday and at no time on Sundays or national holidays. Any construction occurring within 500 feet of residential areas has the potential to exceed the Noise Ordinance limits and should only occur during the time periods specified by the Noise Ordinance. Failure to comply with the Noise Ordinance could result in potentially significant impacts. Two mitigation measures have been recommended that require that the requirements of the Noise Ordinance and other noise attenuating measures be incorporated into the grading plan cover sheet. Compliance with these mitigation measures will reduce this potential impact to less than significant.

Exhibit 4-47 Construction Equipment Noise Levels

Increase in Noise Levels in Excess of Standards Established in the Local General Plan

Long Term Off-Site Impacts

This section examines noise impacts from the proposed project on the surrounding land uses. Specifically traffic noise increases due to the project are examined as well as potential noise impacts from activities on the project site.

Traffic Noise

The project will result in additional traffic on the roadways in the vicinity of the project. This increase in traffic will result in increased noise levels being generated by these roadways. This section analyzes the potential noise impacts from these increases. Table 4-47 presents the noise level changes in future years along roadway segments in the vicinity of the project. Only roadway segments with noise level changes greater than 0.5 CNEL due to the project are shown in Table 4-47. All other roadway segments analyzed had noise level changes of less than 0.5 CNEL.

The first column of Table 4-47 lists the roadway and segments. The next three columns show the change in existing noise levels for three future year scenarios. That is, how much louder or quieter the future noise levels with the project will be compared to the existing conditions. This increase is due to the project as well as all other growth and development in the region. The first two columns present the changes for the year 2025 under two future scenarios. The first scenario is with the buildout of the current City of Irvine General Plan in the year 2025 including all roadways in the General Plan. The second scenario only includes roadway improvements which exist, are committed for construction or would be constructed as part of any new development. The first scenario is referred to as the 2025 Build-Out Toll Network and the second scenario is referred to as the 2025 Constrained Toll Network. Refer to the traffic study prepared for the project for a more complete description of these two scenarios. The final scenario represents post-2040 with the City of Irvine General Plan completely built out and the transportation corridors operating toll-free.

The next three columns "Change in Future Noise Levels Due to Project" show the increase in noise levels due to the project for the same three scenarios. The values show how much of the noise increase over existing conditions shown in columns two through four is due to the traffic generated by the project. The final column of Table 4-47 indicates the existence of residential land uses adjacent to the roadways with either a significant increase over existing levels (3 dB or greater) or significant increase due to the project (1 dB or greater). Significant increases are shown in bold-italic. The traffic volumes used to calculate the noise level changes are presented in the appendix.

Table 4-47
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change In Existing Noise Levels with Project In Year			Change In Future Noise Levels Due to Project			Existing Res.?
	2025 Buildout	2025 Constrained	2040	2025 Buildout	2025 Constrained	2040	
Yale Av.							
South of Meadowood	–	–	–	0.4	0.7	0.3	Yes
Irvine to Bryan	2.1	2.0	2.0	0.9	0.8	0.7	Yes
Bryan to Trabuco	1.1	1.0	1.0	0.5	0.5	0.5	Yes
Trabuco to Walnut	2.5	2.5	2.4	0.6	0.5	0.6	Yes
Jeffrey Rd.							
South of Portola	***6.3***	***4.3***	***5.8***	0.9	***1.8***	***1.0***	No
North of Irvine	***7.3***	***5.8***	***6.9***	***1.8***	***3.3***	***2.0***	No
Irvine to Bryan	***5.7***	***4.9***	***5.5***	***1.9***	***2.7***	***1.9***	Yes
Bryan to Trabuco	***5.7***	***5.0***	***5.5***	***1.6***	***2.2***	***1.6***	No
South of Trabuco	***4.3***	***3.8***	***4.2***	***1.6***	***2.0***	***1.6***	No
North of I-5	***5.0***	***4.8***	***5.0***	***1.0***	***1.2***	***1.0***	No
I-5 to Irvine Center Dr.	***3.4***	***3.3***	***3.6***	0.6	0.7	0.6	Yes
Irvine Center to Barranca	2.3	2.2	2.4	0.5	0.6	0.5	
Sand Canyon Av.							
South of Portola	***5.7***	***4.7***	***4.8***	***1.2***	***2.6***	***1.8***	No
North of Irvine	***7.8***	***7.3***	***7.3***	***3.3***	***5.2***	***4.3***	No
South of Irvine	***6.2***	***5.9***	***5.9***	***4.0***	***5.3***	***4.8***	No
North of Trabuco	***6.2***	***5.9***	***5.9***	***4.0***	***5.3***	***4.8***	No
Trabuco to Roosevelt	***6.7***	***6.8***	***7.0***	***1.9***	***2.3***	***2.0***	No
Roosevelt to Road "B"	***7.0***	***7.1***	***7.3***	***1.2***	***1.5***	***1.4***	No
Road "B" to I-5	***7.0***	***7.1***	***7.3***	0.9	***1.2***	***1.1***	No
I-5 to Oak Canyon	***5.4***	***5.4***	***6.1***	0.5	0.6	0.5	No
Oak Canyon/Irvine Cent.	***4.7***	***4.7***	***5.2***	0.5	0.6	0.5	No
Irvine Center to Barranca	***4.5***	***4.5***	***5.1***	0.4	0.5	0.4	No
Research.							
South of Portola	–	–	–	***1.3***	***1.2***	***1.2***	No
North of Irvine	–	–	–	***1.3***	***1.2***	***1.2***	No
Irvine to Trabuco	–	–	–	0.5	0.4	0.4	
Central Park W.							
Irvine to Culture	–	–	–	***2.7***	***2.7***	***2.7***	No
W. Culture to Trabuco	–	–	–	***2.3***	***2.1***	***2.8***	No
Trabuco to Marine	–	–	–	0.8	0.7	0.7	

– Traffic Data Not Provided or Road Does Not Currently Exist

Table 4-47
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change In Existing Noise Levels with Project In Year			Change In Future Noise Levels Due to Project			Existing Res.?
	2025 Buildout	2025 Constrained	2040	2025 Buildout	2025 Constrained	2040	
Central Park E.							
Irvine to Trabuco	--	–	–	***1.0***	***1.0***	0.7	No
E. Culture							
Millennium to Connector	–	–	–	0.4	0.2	0.9	
Connector to Trabuco	–	–	–	0.3	0.4	0.7	
W. Culture							
Central Park W./W.	–	–	–	***1.8***	***2.2***	***3.0***	No
Culture	–	–	–	0.8	0.8	***1.2***	No
Connector to Millennium							
Millennium Bl.							
South of Portola	–	–	–	***4.4***	***5.3***	***3.1***	No
North of Irvine	–	–	–	***5.3***	***6.3***	***3.9***	No
Irvine to W. Culture	–	–	–	***2.3***	***2.8***	***1.7***	No
South of W. Culture	–	–	–	***2.2***	***2.4***	***1.6***	No
Trabuco to E. Culture	–	–	–	***1.2***	***1.2***	***1.0***	No
North of Central Park E.	–	–	–	***1.2***	***1.2***	***1.0***	No
Alton Pkwy.							
South of Portola	***4.5***	***6.2***	***4.0***	0.6	0.1	0.2	Yes
Portola Pkwy.							
Culver to Yale	***5.8***	***6.5***	***6.0***	0.8	0.9	0.7	Yes
Yale to Jeffrey	***6.6***	***7.0***	***6.9***	0.9	***1.0***	0.8	Yes
Jeffrey to Sand Canyon	***6.3***	***5.6***	***5.7***	***1.1***	***1.5***	***1.1***	No
Sand Canyon to SR-133	***6.5***	***5.6***	***5.5***	***1.9***	***3.0***	***2.7***	No
SR-133 to Research	***6.6***	***5.7***	***5.7***	***2.0***	***3.1***	***2.8***	No
Research to Millennium	***6.2***	***4.9***	***5.2***	***1.1***	***2.0***	***1.6***	No
East of Millennium	***6.9***	***5.6***	***6.1***	***2.1***	***4.1***	***2.3***	No
South of SR-241	***5.4***	2.7	***5.1***	0.5	***1.3***	***1.3***	No
Irvine Bl.							
East of SR-261	2.4	2.3	2.3	0.4	0.5	0.4	
West of Culver	1.4	1.2	1.2	0.8	0.8	0.7	
Culver to Yale	2.4	2.2	2.2	***1.0***	***1.0***	***1.0***	Yes

– Traffic Data Not Provided or Road Does Not Currently Exist

Table 4-47
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change In Existing Noise Levels with Project In Year			Change In Future Noise Levels Due to Project			Existing Res.?
	2025 Buildout	2025 Constrained	2040	2025 Buildout	2025 Constrained	2040	
Irvine Bl. (cont.)							
East of Yale	***4.2***	***3.9***	***4.0***	***1.2***	***1.3***	***1.2***	Yes
West of Jeffrey	***4.4***	***4.0***	***4.2***	***1.0***	***1.0***	0.9	Yes
East of Jeffrey	***5.3***	***4.9***	***5.1***	***1.7***	***2.0***	***1.7***	No
West of Sand Canyon	***4.4***	***4.1***	***4.4***	0.8	***1.1***	***1.0***	No
Sand Canyon to SR-133	***3.6***	***3.7***	***3.8***	***1.1***	***1.3***	***1.2***	No
SR-133 to Research	***4.3***	***4.3***	***4.3***	***1.0***	0.9	***1.0***	No
Research/ Central Park W	***4.0***	***4.1***	***3.6***	0.8	0.7	0.9	No
Central Park W. to Millennium	***3.8***	***3.9***	***3.4***	0.8	0.6	0.8	No
Millennium to Connector	***3.5***	***4.0***	***3.1***	***1.0***	***1.0***	***1.1***	No
Connector/Central Park E	***3.9***	***4.4***	***3.5***	0.8	0.8	0.9	No
Central Park E./Trabuco	***3.8***	***4.3***	***3.4***	0.7	0.7	0.9	No
Trabuco to Alton	***3.5***	***3.8***	***3.2***	0.6	0.6	0.6	No
Bryan Av.							
Yale to Jeffrey	***3.7***	***4.0***	***3.8***	***1.0***	***1.0***	0.9	Yes
Trabuco Rd.							
West of Yale	2.7	2.6	2.3	0.6	0.5	0.5	
Yale to Jeffrey	***8.6***	***8.7***	***8.3***	0.9	0.9	***1.0***	Yes
Jeffrey to Road "A"	***11.6***	***11.6***	***11.2***	0.7	0.5	0.7	No
Road "A" to Collector St.	***10.3***	***10.4***	***10.0***	0.9	0.7	0.9	No
Collector St. to Road "C"	***10.0***	–	***9.7***	0.5	–	0.6	No
Road "C" Sand Canyon	***11.3***	***11.5***	***11.1***	0.5	0.3	0.5	No
Sand Canyon SR-133	–	–	–	0.6	0.4	0.4	
Roosevelt Av.							
West of Sand Canyon	–	–	–	0.7	0.6	0.7	
SR-133							
Trabuco to I-5	***4.3***	***4.4***	***5.4***	0.5	0.4	0.3	No

– Traffic Data Not Provided or Road Does Not Currently Exist

Table 4-47 shows that seven roadway segments are projected to experience significant increases in noise levels due to the project. The project only results in a significant noise impact if the project

causes a significant noise increase and the resulting future noise levels at the residences will be in excess of the City's 65 CNEL standard.

Six of the seven residential areas adjacent to the roadways with significant noise increases due to the project have existing noise barriers. The heights of these barriers and the geometry required to determine the noise reduction provided by the barriers was documented by field surveys and factored into the noise modeling calculations. The future worst case noise levels from the roadways was calculated using the FHWA traffic noise model discussed in the Existing Traffic Noise Levels Section. The future noise levels at the residential areas with significant noise increases due to the project are summarized in Table 4-48 and discussed below. Please note that the unmitigated condition does not take into account existing noise walls that are present. When these noise walls are considered the resulting noise levels within rear yards are reduced by 3 dB or more.

Table 4-48
Summary of Traffic Noise Impacts

Roadway Segment	Exceed 1dB?	Does Unmitigated Condition Exceed 65CNEL?	Existing Noise Walls Present[1]	Impact
Jeffrey (Irvine -Bryan)	Yes, project contributes increase of 1.9-2.7dB	Yes, 65.6 at 100'	No	Significant, Mitigation Required
Portola (Yale to Jeffrey)	Yes, 2025 constrained contributes 1dB increase	No, 61.8 at 100'	Yes	Less Than Significant
Irvine (Culver to Yale)	Yes, project contributes 1dB increase	Yes, 66.5 at 100'	Yes	Less Than Significant
Irvine (East of Yale)	Yes, project contributes 1.2 -1.3 increase	Yes, 65.5 at 100'	Yes	Less Than Significant
Irvine (West of Jeffrey)	yes, project contributes 1dB increase	Yes, 65.5 at 100'	Yes	Less Than Significant
Bryan (Yale to Jeffrey)	Yes, project contributes 1 dB	No, 60.4 at 100'	Yes	Less Than Significant
Trabuco (Yale to Jeffrey)	Yes, 2040 project contributes 1 dB	No, 58.1 at 100'	Yes	Less Than Significant

Note:
1. Where existing noise walls are present, the resulting noise levels are below 65 CNEL and therefore not significant.

Jeffrey Road - Irvine to Bryan

The project is projected to cause 1.9 to 2.7 dB of a 4.9 to 5.7 dB increase in the traffic noise CNEL levels over existing conditions. The Grove mobile home park is located on the west side of Jeffrey south of Irvine Boulevard. South of this there is a farm house and orchard. There is a 5'-9" wall between Jeffrey Road and these residences located 75 feet from the roadway centerline. The residences are at the same elevation as the roadway. Modeling including the effect of this barrier shows that the worst-case future noise levels with the project will exceed the City's 65 CNEL. This means that the project results in a significant noise impact at these homes. Mitigation will be required and is discussed in Section 4.10.3.

Based on traffic projections for the year 2007, this section of roadway will not experience a significant noise increase before the year 2007. In the year 2007 the project is projected to result in 0.2 dB of a 2.4 dB increase over existing conditions. This increase is not significant. Therefore, the existing residential uses along this segment of roadway will not be significantly impacted by the project until sometime after 2007.

Portola Parkway - Yale to Jeffrey

Under the 2025 constrained scenario the project results in a 1.0 dB of a 7.0 dB increase in the existing traffic noise CNEL levels. There are residential uses located to the south of Portola Parkway. A noise barrier is located between Portola Parkway and the residences at a distance of 100 feet from the roadway centerline. The height of the wall ranges from 5 to 6 feet with the elevation of the homes ranging from the roadway elevation to 5 feet below the roadway elevation. Noise modeling including the effect of the noise barrier shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Irvine Boulevard - Culver to Yale

The project is projected to result in 1.0 dB of a 2.2 to 2.4 dB increase in the existing traffic noise CNEL levels. There are residential uses located along both sides of the roadway. There are noise barriers located between the roadway and all of the homes. This barrier is typically 80 feet from the roadway centerline but in some cases is as far as 105 feet from the centerline. The barrier ranges in height from 4 to 7 feet and the homes have pads that range from 3 feet below the roadway to 1 foot above. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Irvine Boulevard - East of Yale

The project is projected to result in 1.2 to 1.3 dB of a 3.9 to 4.2 dB increase in the existing traffic noise CNEL levels. There are residential uses located along both sides of the roadway. There are noise barriers located between the roadway and all of the homes. This barrier is typically 80 feet

from the roadway centerline but in some cases is as far as 105 feet from the centerline. The barrier ranges in height from 5 to 6.5 feet and the homes have pads that range from 1.5 feet below the roadway to at roadway grade. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Irvine Boulevard - West of Jeffrey

The project is projected to result in 1.0 dB of a 4.0 to 4.4 dB increase in the existing traffic noise CNEL levels under the 2025 scenarios. There are residential uses located along both sides of the roadway. There are noise barriers located between the roadway and all of the homes. This barrier is typically 80 feet from the roadway centerline but in some cases is as far as 105 feet from the centerline. The barrier ranges in height from 5 to 6.5 feet and the homes have pads that range from 1.5 feet below the roadway to at roadway grade. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Bryan Avenue - Yale to Jeffrey

The project is projected to result in 1.0 dB of a 3.7 to 4.0 dB increase in the existing traffic noise CNEL levels under the 2025 scenarios. There are residential uses located along both sides of the roadway. There are noise barriers located between the roadway and all of the homes. This barrier is 48 to 57 feet from the roadway centerline. The barrier ranges in height from 4.5 to 8 feet and the homes have pads that range from 2.5 feet below the roadway to 4 feet above roadway grade. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Trabuco Road - Yale to Jeffrey

The project is projected to result in 1.0 dB of a 8.3 dB increase in the existing traffic noise CNEL levels under the 2040 scenarios. There are residential uses located along both sides of the roadway. There are noise barriers located between the roadway and all of the homes. This barrier is 78 to 90 feet from the roadway centerline. The barrier ranges in height from 5 to 6.5 feet and the homes have pads that range from 2 feet below the roadway to 2 feet above roadway grade. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65 CNEL. Therefore the project will not result in a significant noise impact at these homes.

Significant increases over existing conditions occur for two roadway segments. Jeffrey Road from I-5 to Irvine Center Drive and Alton Parkway south of Portola. The noise increases along these

roadway segments are not substantially due to the project. These increases represent cumulative noise impacts and are discussed in the Cumulative Impacts Section.

On-Site Activities

Off-site impacts from on site activities typically only occur where commercial uses directly abut residential uses (i.e. there is no intervening roadway). The project proposes residential land uses in the areas of the project that are directly adjacent to existing residential land uses. In any case, all uses within the project will be required to comply with the City of Irvine Noise Ordinance. There are no currently known uses within the project that would preclude compliance with the Noise Ordinance at any adjacent land uses. Therefore, the project will not result in any off-site noise impacts due to on-site activities.

LOS "E" Noise Analysis

The project proposes to consider amending the City's Circulation Element to establish LOS "E" as the acceptable level of service for specific intersections within the existing Irvine Spectrum and Medical Science zoned areas within the Northern Sphere Area. The current Circulation Element identifies LOS "D" as the target level of service. As discussed in greater detail in Section 4.14, "Transportation/Circulation," the average travel speed along an urban street is the determinant of the operating level of service. An intersection with a LOS "E" is characterized by greater congestion and slower travel speeds than an intersection operating at LOS "D."

Noise levels on a roadway segment are determined by the number of vehicles and the speed they are traveling. The posted speed limit was utilized in the noise modeling for this analysis. No circulation improvements were assumed in the noise modeling of various roadway segments. Noise levels at midblock are representative of noise at the intersection. Near an intersection over a period of time, some of the vehicles will be slowing resulting in lower noise levels than a vehicle cruising at the speed limit and others will be accelerating resulting in higher noise levels. Many vehicles will cruise through the intersection at or near the speed limit. Allowing the acceptable level of service to be LOS "E" rather than "D" at intersections may result in more vehicles slowing and then accelerating through the intersection but it does not affect the noise level at the intersection. Further, the change in acceptable LOS will not affect the number of vehicles traveling on a roadway link. Therefore, the noise levels generated by a roadway link are not affected by the LOS at intersections. It should also be noted that the change of acceptable LOS "D" to "E" is only proposed at intersections with no adjacent existing residential uses. Therefore, this change will not affect any existing residential uses.

Long Term On-Site Impacts

Traffic Noise

Future worst-case with project highway noise levels in terms of CNEL were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The CALVENO noise emission curves developed by Caltrans were used with the FHWA model. These curves better model the California vehicle mix. The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used.

Table 4-49 presents the future worst-case traffic noise levels for roads impacting the project. The CNEL level at a distance of 100 feet from the roadway centerline is presented along with the distances, from the centerline to the 60, 65 and 70 CNEL contours.

Table 4-50 presents the traffic noise impacts on the project. The land use on each side of each roadway segment is listed along with the distance from the centerline to the nearest use are shown in the first three columns of the table. At this time plans showing the locations of the specific uses was not available. The distance shown in the fourth column of Table 4-50 is the expected distance from the centerline to the nearest outdoor area. Buildings were assumed to be located 10 feet beyond this due to minimum setback requirements. The outdoor CNEL noise level and applicable standard are presented in the fifth and sixth columns. The seventh column of the table indicates if the outdoor noise level results in a significant impact. Indoor noise levels for the buildings adjacent to the roadway are presented in the eighth and ninth columns. The eighth column presents the noise levels with windows open and the ninth column presents the indoor levels with windows closed.

Typical construction achieves at least 20 dB of outdoor-to-indoor noise reduction with windows closed and this reduction falls to 12 dB with windows open. Mechanical ventilation or air conditioning is required to assume that windows can remain closed. The most stringent applicable indoor noise standard is presented in the tenth column. Note that for commercial/industrial uses the most stringent standard is the 50 CNEL standard for offices. Other applicable standards are 55 CNEL for retail uses and 65 CNEL for manufacturing, warehouse and wholesale uses. The final column of the table presents if the roadway significantly impacts the indoor areas of the project for the most stringent standard. There are separate indicators for with windows open and with windows closed. Typically, commercial uses include mechanical ventilation or air conditioning to allow a windows closed assumption while this is not always true for residential uses.

Table 4-49
Future Traffic Noise Levels for Roads Impacting Project

Roadway & Segment	CNEL @ 100 feet	Distance to Contour		
		70 CNEL	65 CNEL	60 CNEL
Jeffrey Rd.				
SR-241 to Portola		67.6	69	145
				313
South of Portola	69.8	97	208	448
North of Irvine	70.6	110	237	512
Irvine to Bryan	71.8	131	282	609
Bryan to Trabuco	71.9	133	287	619
Sand Canyon Av.				
South of Portola	70.1	102	220	474
North of Irvine	71.5	126	272	586
Sand Canyon Av.				
South of Irvine	72.0	135	292	629
North of Trabuco	72.0	135	292	629
Research				
South of Portola	68.4	78	169	364
North of Irvine	68.4	78	169	364
Millennium Bl.				
South of Portola	67.8	71	153	329
North of Irvine	68.6	81	175	377
Portola Pkwy.				
Yale to Jeffrey	69.8	98	210	453
Jeffrey to Sand Canyon	69.1	87	187	402
Sand Canyon to SR-133	71.7	129	278	600
SR-133 to Research	71.4	125	269	579
Research to Millennium	69.8	96	207	447
East of Millennium	70.7	111	239	515
South of SR-241	69.3	90	194	417
Irvine Bl.				
West of Jeffrey	70.9	115	247	533
East of Jeffrey	71.4	124	268	578
West of Sand Canyon	70.5	108	233	501
Sand Canyon to SR-133	71.0	116	250	538
SR-133 to Research	71.4	124	266	574
Millennium to Connector	71.5	125	270	582
Bryan Av.				
Yale to Jeffrey	64.4	42	91	195
Trabuco Rd.				
Yale to Jeffrey	66.8	61	131	282
Jeffrey to Road "A"	67.9	73	157	339
Road "A" to Collector St.	67.8	71	154	331
Collector St. to Road "C"	67.4	67	144	311
Road "C" Sand Canyon	67.8	71	153	330
Sand Canyon SR-133	70.1	101	219	471

Table 4-49
Future Traffic Noise Levels for Roads Impacting Project

Roadway & Segment	CNEL @ 100 feet	Distance to Contour		
		70 CNEL	65 CNEL	60 CNEL
SR-133 to Research	71.8	131	283	610
SR-241				
Culver to Jeffrey	78.6	376	810	1744
Jeffrey to SR-133	78.8	383	826	1780
SR-133 to Portola	79.2	412	889	1914
Portola to Alton	78.9	395	851	1833
SR-133				
SR-241 to Irvine	78.6	375	808	1741
Irvine to Trabuco	78.6	372	801	1726

It should be noted that the noise levels presented in Table 4-50 are the worst-case noise levels for uses located directly along the roadways. Site design could be effectively used to move rear residential yards and buildings away from the roadways reducing the noise levels impacting these uses.

Table 4-50 shows that all residential uses except along Jeffrey Boulevard North of Portola will experience outdoor noise levels in excess of 65 CNEL and will be significantly impacted by traffic noise. Mitigation will be required to reduce the noise levels at these homes and is discussed in Section 4.10.1. Note that while the area east of Jeffrey and north of Portola will be zoned residential under the project. Current plans call for a community park to be located in this area. The 65 CNEL outdoor noise standard for parks only applies to picnic areas. Any picnic areas in the park closer than 150 feet from the centerline of Jeffrey Road or 187 feet from the centerline of Portola Parkway would be exposed to noise levels greater than 65 CNEL. Picnic areas for the park should be located at greater distance from these roadways.

Indoor noise levels along all roadways will exceed the most stringent indoor noise standard for all uses with windows open or closed. If homes were located along the east side of Jeffrey north of Portola the interiors will be significantly impacted by traffic noise unless mechanical ventilation is provided. No additional building upgrades will be required along Collector Street. For the retail areas, the 55 CNEL interior standard for retail areas will be met with windows closed except along SR-241 where additional building upgrades may be required. For some areas along Portola Parkway and Trabuco Road the 50 CNEL interior standard for office uses will be met with windows closed. Buildings along the roadways with indoor areas having significant impacts with windows closed will require further mitigation.

Insert Table 4-50 - Traffic Noise Impacts on Project

Page 1

Insert Table 4-50 - Traffic Noise Impacts on Project

Page 2

Insert Table 4-50 - Traffic Noise Impacts on Project

Page 3

Insert Table 4-50 - Traffic Noise Impacts on Project

Page 4

Indoor noise levels are not projected to exceed the 65 CNEL interior standard for manufacturing, warehousing or wholesale uses and no mitigation will be required for these uses.

Prior to the issuance of grading permits for any residential area a detailed acoustical study shall be prepared by a qualified acoustical consultant and submitted to the City. This report shall describe and quantify the noise sources impacting the area and the measures required to meet the 65 CNEL exterior residential noise standard. The measures described in the report shall be incorporated into the grading plans. Prior to issuance of building permits a detailed acoustical study shall be prepared by a qualified acoustical consultant and submitted to the City. This report shall describe and quantify the noise sources impacting the building(s) and the measures required to meet the appropriate interior noise standard given in previous Table 4-44. The measures described in the report shall be incorporated into the building plans.

By requiring the project to meet the noise standards presented in previous Table 4-44 and providing a mechanism to ensure that these standards are met through the acoustical analyses required prior to issuance of permits the on-site significant noise impact will be mitigated. To ensure that it is feasible to meet the noise standards a preliminary analysis was performed to determine the potential worst-case measures to meet the outdoor and indoor noise standards. The results of this analysis are presented in Tables 4-51 and 4-52.

Table 4-51 shows the preliminary worst-case measures to meet the outdoor noise standard (65 CNEL) for residential areas. Specifically the measures are noise barriers located between the roadway and the residential areas. The analysis assumed that the barrier is 10 feet outside the roadway right of way and the roadway, base of barrier and residential pad are all at the same elevation. This assumption results in the worst-case height for the noise barrier unless there is a grade difference between the road and the pad and the barrier cannot be placed at the higher elevation. This is not expected to be the case anywhere for the project.

In the case of SR-241 the toll-road is located at a higher elevation than the residential areas. In this case the barrier was assumed to be located along the toll-road and likely in the toll-road right of way. This will require some coordination with Caltrans. It was assumed that the residential pads were 20 feet below the toll-road elevation and 150 feet from the centerline. The wall was assumed to be located 100 feet from the centerline of the toll-road.

Table 4-52 shows the preliminary worst-case measures to meet the indoor noise standards. The need for mechanical ventilation is shown along with the required outdoor-to-indoor noise reduction if the reduction is greater than 20 dB. For buildings requiring more than 12 dB but less than 20 dB of outdoor-to-indoor noise reduction to meet the appropriate standard, mechanical ventilation per the UBC will be required to assume that windows can remain closed. Windows do not need to be sealed shut, but closeable at the occupant's discretion. For buildings requiring more than 20 dB of noise reduction detailed engineering calculations will be required to determine additional building upgrades that are required to meet the applicable noise standard.

Table 4-51
Preliminary Worst-Case Measures to Meet Outdoor Noise Standards

Roadway & Segment	Side	Land Use	Measure
Jeffrey Rd.			
South of Portola	West	Residential	6.5 Foot High Noise Barrier
South of Portola	East	Residential	6.5 Foot High Noise Barrier
North of Irvine	West	Residential	7.0 Foot High Noise Barrier
North of Irvine	East	Residential	5.0 Foot High Noise Barrier
Irvine to Bryan	East	Residential	5.0 Foot High Noise Barrier
South of Bryan	East	Residential	5.0 Foot High Noise Barrier
South of Bryan	West	Residential	5.0 Foot High Noise Barrier
Sand Canyon Av.			
South of Irvine	West	Residential	
North of Trabuco	West	Residential	7.5 Foot High Noise Barrier
Millennium Bl.			
South of Portola	West	Residential	
South of Portola	East	Residential	6.0 Foot High Noise Barrier
Portola Pkwy.			
West of Jeffrey	South	Residential	7.0 Foot High Noise Barrier
East of Jeffrey	North	Residential	6.5 Foot High Noise Barrier
East of Jeffrey	South	Residential	6.5 Foot High Noise Barrier
Research to Millennium	North	Residential	7.0 Foot High Noise Barrier
Research to Millennium	South	Residential	7.0 Foot High Noise Barrier
East of Millennium	North	Residential	7.5 Foot High Noise Barrier
East of Millennium	South	Residential	7.5 Foot High Noise Barrier
South of SR-241	North	Residential	7.0 Foot High Noise Barrier
South of SR-241	South	Residential	7.0 Foot High Noise Barrier
Irvine Bl.			
West of Jeffrey	North	Residential	7.0 Foot High Noise Barrier
East of Jeffrey	North	Residential	7.5 Foot High Noise Barrier
East of Jeffrey	South	Residential	7.5 Foot High Noise Barrier
West of Sand Canyon	South	Residential	7.0 Foot High Noise Barrier
Bryan Av.			
Yale to Jeffrey	South	Residential	5.0 Foot High Noise Barrier
Trabuco Rd.			
Yale to Jeffrey	North	Residential	5.5 Foot High Noise Barrier
Jeffrey to Road "A"	North	Residential	6.0 Foot High Noise Barrier
Road "A" to Collector St.	North	Residential	6.0 Foot High Noise Barrier
Collector St. to Road "C"	North	Residential	6.0 Foot High Noise Barrier
Road "C" Sand Canyon	North	Residential	6.0 Foot High Noise Barrier
SR-241			
West of Portola	South	Residential	4.0 Foot High Noise Barrier

Table 4-52
Preliminary Worst-Case Measures to Meet Indoor Noise Standards

Roadway & Segment	Side	Land Use	Measure
Jeffrey Rd.			
North of Portola	East	Residential	Mech. Vent.
South of Portola	West	Residential	Mech. Vent. + Bldg. Upgrds. (25 dB NR)
South of Portola	East	Residential	Mech. Vent. + Bldg. Upgrds. (21 dB NR)
North of Irvine	West	Residential	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
North of Irvine	East	Residential	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
Irvine to Bryan	East	Residential	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
South of Bryan	East	Residential	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
South of Bryan	West	Residential	Mech. Vent. + Bldg. Upgrds. (28 dB NR)
Sand Canyon Av.			
South of Portola	West	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (21 dB NR)
South of Portola	West	Potential Retail	Mech. Vent.
South of Portola	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (21 dB NR)
North of Irvine	West	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
North of Irvine	West	Potential Retail	Mech. Vent.
North of Irvine	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
South of Irvine	West	Residential	Mech. Vent. + Bldg. Upgrds. (27 dB NR)
South of Irvine	West	Potential Retail	Mech. Vent.
South of Irvine	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
North of Trabuco	West	Residential	Mech. Vent. + Bldg. Upgrds. (28 dB NR)
North of Trabuco	West	Potential Retail	Mech. Vent.
North of Trabuco	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
Research			
South of Portola	West	Comm./Ind.	Mech. Vent.
South of Portola	East	Comm./Ind.	Mech. Vent.
North of Irvine	West	Comm./Ind.	Mech. Vent.
Millennium Bl.			
South of Portola	West	Residential	Mech. Vent. + Bldg. Upgrds. (25 dB NR)
South of Portola	East	Residential	Mech. Vent. + Bldg. Upgrds. (25 dB NR)
North of Irvine	West	Comm./Ind.	Mech. Vent.
North of Irvine	East	Comm./Ind.	Mech. Vent.
East of Millennium	South	Residential	Mech. Vent. + Bldg. Upgrds. (27 dB NR)
East of Millennium	South	Potential Retail	Mech. Vent.
South of SR-241	North	Residential	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
South of SR-241	North	Potential Retail	Mech. Vent.
South of SR-241	South	Residential	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
Irvine Bl.			
West of Jeffrey	North	Residential	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
East of Jeffrey	North	Residential	Mech. Vent. + Bldg. Upgrds. (27 dB NR)
East of Jeffrey	South	Residential	Mech. Vent. + Bldg. Upgrds. (27 dB NR)
West of Sand Canyon	North	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
West of Sand Canyon	Both	Potential Retail	Mech. Vent.
West of Sand Canyon	South	Residential	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
Sand Canyon to SR-133	North	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
Sand Canyon to SR-133	South	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
SR-133 to Research	North	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
Millennium to Connector	North	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
Bryan Av.			
Yale to Jeffrey	South	Residential	Mech. Vent. + Bldg. Upgrds. (21 dB NR)

Table 4-52
Preliminary Worst-Case Measures to Meet Indoor Noise Standards

Roadway & Segment	Side	Land Use	Measure
Trabuco Rd.			
Yale to Jeffrey	North	Residential	Mech. Vent. + Bldg. Upgrds. (24 dB NR)
Jeffrey to Road "A"	North	Residential	Mech. Vent. + Bldg. Upgrds. (25 dB NR)
Road "A" to Collector St.	North	Residential	Mech. Vent. + Bldg. Upgrds. (24 dB NR)
Collector St. to Road "C"	North	Residential	Mech. Vent. + Bldg. Upgrds. (24 dB NR)
Road "C" Sand Canyon	North	Residential	Mech. Vent. + Bldg. Upgrds. (24 dB NR)
Road "C" Sand Canyon	North	Potential Retail	Mech. Vent.
Sand Canyon SR-133	North	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
SR-133 to Research	North	Comm./Ind.Mech.	Mech. Vent. + Bldg. Upgrds. (23 dB NR)
SR-241			
East of SR-133	South	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (27 dB NR)
West of Portola	South	Residential	Mech. Vent. + Bldg. Upgrds. (32 dB NR)
West of Portola	South	Potential Retail	Mech. Vent. + Bldg. Upgrds. (22 dB NR)
SR-133			
South of SR-241	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
North of Irvine	West	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
North of Irvine	East	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (26 dB NR)
Irvine to Trabuco	West	Comm./Ind.	Mech. Vent. + Bldg. Upgrds. (26 dB NR)

For buildings requiring between 20 and 24 dB of outdoor-to-indoor attenuation upgraded (thicker) windows may be required. For buildings requiring between 24 and 28 dB of noise reduction upgraded windows will be required. For buildings requiring between 28 and 33 dB of noise reduction structural building upgrades (e.g. thicker walls and/or roofs and attic vent baffles) will likely be required along with substantial window upgrades. It is quite difficult to achieve more than 33 dB of outdoor-to-indoor noise reduction. In no case is more than 33 dB of noise reduction required. Also note that the noise reduction listed in Table 4-52 is worst-case and could be significantly reduced through site design by moving buildings away from roadways.

Tables 4-51 and 4-52 show that it is feasible to meet the outdoor and indoor noise standards without requiring extraordinary measures. The measures presented in these table should be considered worst-case. Use of site design, locating uses away from roadways, would reduce and potentially eliminate many of the measures presented in the tables. As discussed above, detailed acoustical studies will be required to determine the specific measures required.

On-Site Activities

As discussed previously, impacts on residential areas typically occur only where the residential areas directly abut commercial areas. In general, proposed residential areas are located on the opposite sides of roadways from proposed commercial areas. The exceptions to this occur at the potential retail sites that may be located at the northwest corner of Trabuco and Sand Canyon, the southwest

corner of Irvine and Sand Canyon, south of Portola Parkway between Millennium and SR-241 and at the southwest corner of SR-241 and Portola Parkway. Additionally there are Research/Industrial uses proposed immediately south of residential uses on the east side of the project between Portola Parkway and Irvine Boulevard.

Three sources of noise from retail sites and research/industrial areas have the potential to impact residential uses. Parking lot activity and mechanical equipment can result in noise levels that exceed the Noise Ordinance limits. Of most concern are delivery trucks especially those that occur during the nighttime hours. In addition, specific uses in the research/industrial not yet identified area could generate significant noise levels.

In any case, all of the commercial uses located adjacent to homes proposed by the project will need to comply with the City of Irvine Noise Ordinance. Typically this will only be a concern at the potential retail sites located directly adjacent to residential uses. It is possible that some uses in the Research/Industrial portions of the project will result in exceedences of the Noise Ordinance. Mitigation to ensure compliance with the Noise Ordinance is discussed in Section 4.10.3.

Off-Site Activities

The project proposes only residential uses directly abutting existing residential uses. As discussed previously impacts on residential areas typically only occur where the residential areas directly abut commercial areas. This will not occur with this project. Further there are no known existing noise generating activities on private property that will result in an exceedence of the City of Irvine Noise Ordinance at the proposed residential areas. Therefore, there are no noise impacts on the project site from activities outside of the project.

Exposure of People to Excessive Noise Levels Due to Location Within an Airport Land Use Plan

The current General Plan of the City of Irvine does not include an airport at the former El Toro Military Base. However, the County of Orange is proceeding with the planning of a commercial airport at the former base. Exhibit 4-48 shows the project site plan with the projected aircraft CNEL noise contours for the El Toro Aviation Plan Alternative B taken from EIR No. 573 for the Civilian Reuse of El Toro MCAS. The exhibit shows that a portion of the proposed residential uses in the northwest corner of the project would be exposed to aircraft noise levels greater than the residential 65 CNEL standard. There would be no way of effectively mitigating outdoor noise levels to below 65 CNEL. There are uses allowed in residential areas that do not have outdoor noise standards including churches and parks (without picnic areas) Exterior noise levels would be below 70 CNEL and interior levels could be mitigated to below the 45 CNEL interior residential or church standards with moderate building upgrades.

Several residential areas of the project would be exposed to aircraft noise levels less than 65 CNEL but greater than 55 CNEL. In these areas the mitigation required to reduce exterior noise levels to below the 65 CNEL standard along roadways would be greater than without the aircraft noise as presented in Section 4.10.3. As the aircraft noise approaches 65 CNEL the increase in required noise barrier heights would be significant. Barriers as high as 10 to 15 feet could be required. Further, measures required to meet the 45 CNEL interior standard would be increased over what would be required without the airport. All homes within the 57 CNEL aircraft contour would require mechanical ventilation.

Cumulative Impacts

This section analyzes off site traffic noise impacts due to the project when considered together with the cumulative growth projected in adopted general plans and projections. The cumulative noise impacts of the project is presented in Table 4-47 (Change in Traffic Noise CNEL Levels). Cumulative impacts are those noise level increases over existing conditions under the post-2040 scenario. Increases 3 dB or greater over existing conditions represent a significant cumulative impact. The project's contribution to these impacts is discussed below in the section titled General Plan Buildout.

General Plan Buildout with Millennium Plan II

Column 4 of Table 4-47 “Change in Existing Noise Levels with Project in Year 2040) shows that two roadway segments with adjacent residential uses are projected to experience significant cumulative noise level increases over existing conditions (a 3dB increase) where the project itself does not already result in a significant increase. These roadway segments are Jeffrey Road from I-5 to Irvine Center Drive and Alton Parkway South of Portola.

Exhibit 4-48 OCX Alternative B Aircraft Noise Contours

Jeffrey Road - I-5 to Irvine Center Drive

The project is projected to result in 0.6 dB to 0.7 dB of a 3.4 to 3.6 dB increase in the existing traffic noise CNEL levels. There are residences located along the west side of the roadway. The southernmost residences are single-family homes. These homes are located 60 feet from the roadway centerline and there is a 5.8-foot high noise barrier. The pads of these homes range from 2 feet below the roadway grade to 2 feet above. Noise modeling including the effect of the existing noise barrier shows that the worst-case future with project noise levels will exceed 65 CNEL.

Just north of the single-family homes are multi-family homes, the Smoketree development. These homes have patios located approximately 100 feet from the centerline with 5.5-foot barriers. The elevations of these homes range from even with the roadway to 3 feet below the roadway elevation. Noise modeling including the effect of the existing noise barrier shows that the worst-case future with project noise levels will slightly exceed 65 CNEL.

The Meadows mobile home park is located north of the railroad tracks and the Smoketree development. There is a 5.5-foot high wall between the roadway and these homes located 70 feet from the centerline. The pads of these homes are located between 2 and 5 feet below the roadway grade. Noise modeling including the effect of the noise barrier shows that the worst-case future with project noise levels will not exceed 65 CNEL.

The City of Irvine is currently in the design stage of a roadway undercrossing for Jeffrey Road between Irvine Center Drive and I-5. This will lower the roadway approximately 20 feet below its current elevation at the rail crossing with the roadway sloping up as it travels away from this low point. As a part of this project a noise analysis per FHWA/Caltrans criteria was performed (Federal Highway Administration funds will be used for the project). To meet the FHWA/Caltrans criteria a 10-foot high wall will be required to be constructed for the single family homes and a portion of the Smoketree development. Where the wall is not required for the Smoketree development the lowering of the roadway will reduce noise levels at the homes. The walls and the lowering of the roadway will result in future worst-case with project noise levels not exceeding 65 CNEL at the homes. Therefore there will not be a cumulative significant noise impact at these homes.

Alton Parkway - South of Portola

The project is projected to result in 0.1 dB to 0.6 dB of a 4.0 to 6.2 dB increase in the existing traffic noise CNEL levels. There are residences located along the west side of the roadway. There is a noise barrier located between the roadway and all of the homes. This barrier is approximately 80 feet from the roadway centerline. The barrier is 6 feet high above the pad elevations and the homes have pads that range from 15 to 20 above roadway grade. Noise modeling including the effect of the noise barriers show that the worst-case future with project noise levels will remain below 65 CNEL. Therefore there will not be a significant cumulative noise impact at these homes.

Special Future Case Scenarios

Consistent with the future scenarios analyzed in the traffic study and discussed in Section 4.14, Transportation/Traffic, this DEIR noise analysis reflects the three other future potential land use/transportation scenarios. These scenarios are: 2025 with "Probable Future Projects," 2025 with Oak Canyon, and 2025 with the OCX El Toro Aviation Plan. All of these alternative land use or circulation scenarios include the proposed project. The proposed project is not changed, rather the surrounding land use or roadway network has been altered as a result of these possible variances in future development surrounding the project area. This analysis describes the difference in noise impacts with alternative land use and/or roadway network scenarios around the project.

General Plan Buildout with OCX (El Toro Aviation Plan)

The County of Orange has adopted the El Toro Aviation Plan for the closed El Toro Marine Corps Base. The City of Irvine General Plan currently reflects the land uses of the Millennium Plan which are included in the assumptions to calculate noise level increases presented previously. Changes in traffic noise levels with the El Toro Aviation Plan are presented in Table 4-53. Table 4-53 presents the roadway segments that will have increases in future (2025) noise levels due to the project and the El Toro Aviation Plan (OCX Airport) of more than 0.5 dB. For all roadways not listed in the table, the project combined with the El Toro Aviation Plan will result in future noise level increases of less than 0.5 dB. The traffic study presents the details of the El Toro Aviation Plan scenario.

The first column of Table 4-53 lists the roadway segments. The second column shows change in existing CNEL noise levels in the Year 2025 with the project and the El Toro Aviation Plan. The next three columns show the contributions to this increase due to the project, the El Toro Aviation Plan and the combined increase due to the project and the El Toro Aviation Plan. The final column shows if residential uses currently exist adjacent to the roadways with significant noise increases. Significant noise increases are shown in bold italics.

Four road segments will experience traffic noise increases due to the combination of the project and the El Toro Aviation Plan of 1 dB or greater. For two of these road segments, Jeffrey between Irvine and Bryan and Irvine east of Yale, it is the project that causes the significant increase. The El Toro Aviation Plan does not significantly change the noise levels along these roadways. Along Irvine east of Yale future noise levels will remain below the City's 65 CNEL noise standard at the residences as discussed in Long Term Off-Site Impacts. This section shows that the noise levels at the residences along Jeffrey between Irvine and Bryan will exceed the 65 CNEL standard and the project will result in a significant impact. Mitigation is discussed in Section 4.10.3 and will be required to reduce future ultimate noise levels to below 65 CNEL.

Two road segments will experience traffic noise increases due to the combination of the project and the El Toro Aviation Plan of 1 dB or greater that do not experience this increase due the project or the El Toro Aviation Plan alone. These roads are Yale from Irvine to Bryan and Alton South of

Portola. As discussed in the section entitled General Plan Build-Out worst case future noise levels with the project will not exceed 65 CNEL at homes along Alton south of Portola. As previously discussed, worst case future noise levels with the project will not exceed 65 CNEL at homes along Yale between Irvine and Bryan. Therefore, the project in combination will not result in a significant noise impact at these homes.

Table 4-53
Change in Traffic Noise CNEL Levels
with El Toro Aviation Plan

		Change In Future Due To			Existing Res.?
Roadway & Segment	**Change From Existing Levels**	**Project**	**OCX**	**Project + OCX**	
Culver Dr.					
Irvine to Bryan	1.6	0.4	0.2	0.6	
Bryan to Trabuco/I-5	1.5	0.3	0.2	0.5	
Yale Av.					
South of Meadowood	--	0.4	0.2	0.6	
Irvine to Bryan	2.4	0.9	0.3	***1.1***	Yes
Bryan to Trabuco	1.5	0.5	0.4	0.9	
Jeffrey Rd.					
South of Portola	***7.0***	0.9	0.7	***1.5***	No
North of Irvine	***7.9***	***1.8***	0.5	***2.4***	No
Irvine to Bryan	***6.2***	***1.9***	0.5	***2.3***	Yes
Bryan to Trabuco	***6.1***	***1.6***	0.5	***2.1***	No
South of Trabuco	***4.5***	***1.6***	0.1	***1.7***	No
North of I-5	***5.0***	***1.0***	0.0	***1.0***	No
I-5 to Irvine Center Dr.	***3.4***	0.6	0.0	0.6	Yes
Irvine Center Dr. to Barranca	2.3	0.5	0.0	0.5	
Sand Canyon Av.					
South of Portola	***7.6***	***1.2***	2.0	***3.1***	No
North of Irvine	***9.0***	***3.3***	1.2	***4.5***	No
South of Irvine	***7.3***	***4.0***	1.1	***5.1***	No
North of Trabuco	***7.3***	***4.0***	1.1	***5.1***	No
Trabuco to Roosevelt	***6.8***	***1.9***	0.1	***2.1***	No
Roosevelt to Road "B"	***7.2***	***1.2***	0.2	***1.4***	No
Road "B" to I-5	***7.2***	0.9	0.2	***1.1***	No
Millennium Bl.					
Alton to Rockfield	–	0.2	-4.8	-4.6	

Table 4-53
Change in Traffic Noise CNEL Levels
with El Toro Aviation Plan

Roadway & Segment	Change From Existing Levels	Change In Future Due To			Existing Res.?
		Project	OCX	Project + OCX	
Alton Pkwy.					
South of Portola	***5.1***	0.6	0.5	***1.1***	Yes
Commercentre to Trabuco	–	0.1	-0.8	-0.7	
Trabuco to Irvine	–	0.0	***2.6***	***2.6***	No
Irvine to Fairbanks	***5.8***	0.3	***1.0***	***1.3***	No
Fairbanks to Toledo	***7.3***	0.3	0.7	***1.0***	No
South of Toledo	***3.1***	0.2	0.4	0.6	No
North of Jeronimo	2.6	0.0	0.6	0.6	
Millennium to Ada	***3.3***	0.1	0.6	0.6	No
Ada to Technology	2.0	0.1	0.5	0.5	
Technology to I-5	1.8	0.1	0.5	0.6	
Bake Pkwy.					
Portola to SR-241	0.0	0.2	0.5	0.7	
Rockfield to Millennium	0.0	0.0	0.4	0.5	
Millennium to I-5	0.1	0.1	-0.9	-0.8	
South of I-5	***4.7***	0.1	-0.8	-0.8	No
North of Irvine Center Dr.	-0.7	0.2	-0.9	-0.7	
South of Irvine Center Dr.	–	0.0	-0.7	-0.7	
North of Lake Forest	–	0.0	-0.7	-0.7	
Portola Pkwy.					
Culver to Yale	***5.9***	0.8	0.1	0.8	Yes
Yale to Jeffrey	***6.7***	0.9	0.0	0.9	Yes
Jeffrey to Sand Canyon	***6.4***	***1.1***	0.1	***1.2***	No
Sand Canyon to SR-133	***8.1***	***1.9***	1.5	***3.4***	No
SR-133 to Research	***7.8***	***2.0***	1.2	***3.2***	No
Research to Millennium	***6.1***	***1.1***	-0.1	***1.1***	No
East of Millennium	***6.2***	***2.1***	-0.8	***1.4***	No
South of SR-241	***5.7***	0.5	0.4	0.9	No
North of SR-241	–	0.3	0.4	0.8	
West of Alton	***6.2***	0.2	0.4	0.6	Yes
Irvine Bl.					
West of Culver	1.2	0.8	-0.2	0.6	
Culver to Yale	2.3	***1.0***	-0.1	0.9	Yes
East of Yale	*4.1*	***1.2***	-0.1	***1.1***	Yes
West of Jeffrey	*4.2*	***1.0***	-0.2	0.8	Yes
East of Jeffrey	*5.3*	***1.7***	-0.1	***1.6***	No

Five roadway segments are projected to have significant increases over existing conditions with the project and the El Toro Aviation Plan. These segments are, Jeffrey Road from I-5 to Irvine Center,

Portola Parkway from Culver to Yale, Portola Parkway from Yale to Jeffrey, Portola Parkway West of Yale and Irvine Boulevard West of Jeffrey. The increases over existing conditions are significant with the project alone. The contribution of the El Toro Aviation Plan to these increases is not significant.

Probable Future Projects

The "Probable Future Projects" scenario presents a sensitivity run under 2025 build-out toll network conditions assuming the build-out of the Northern Sphere Area and the inclusion of "probable future projects" developments. These "probable future projects" have either filed applications, are expected to be included in the March 2002 ballot measure or have been announced by The Irvine Company with the intent to modify existing approved plans. This sensitivity scenario is compared to the baseline 2025 build-out toll with project forecasts. These "probable future projects" include Lower Peters Canyon Intensity Transfer (including Planning Area 4), Irvine Spectrum Housing (Planning Areas 17, 31, 33 and 34), the Woodbridge General Plan Amendment (Irvine Planning Area 15), and the City of Irvine's proposed Great Park Plan for the former Marine Corps (MCAS) El Toro. The City of Irvine's proposed Master Plan of Arterial Highways (MPAH) Amendment to delete Culver Drive between Portola Parkway and SR-241 is also included. Lastly, development reductions have been assumed in the East Orange area reflecting The Irvine Company's intention to expand permanent open space within this area.

Table 4-54 presents the potential noise increases due to these projects alone and in combination with the "Probable Future Projects." Table 4-54 presents the roadway segments that will have increases in future (2025) noise levels due to the combination of the project and "Probable Future Projects" of more than 0.5 dB. For all roadways not listed in the table, the project combined with "Probable Future Projects" will result in future noise level increases of less than 0.5 dB.

The first column of Table 4-54 lists the roadway segments. The second column shows change in existing CNEL noise levels in the Year 2025 with the project and the "Probable Future Projects." The next three columns show the contributions to this increase due to the project, "Probable Future Projects" and the combined increase due to the project and the "Probable Future Projects". The final column shows if residential uses currently exist adjacent to the roadways with significant noise increases. Significant noise increases are shown in bold italics.

Table 4-54
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change From Existing Levels	Change In Future Due To			Existing Res.?
		Project	NAPFP	Project + NAPFP	
Santiago Canyon Rd.					
Jamboree to SR-241	--	0.1	-0.6	-0.5	
Chapman Av.					
Jamboree to SR-241	0.5	0.2	-0.8	-0.6	
Canyon View Av.					
Newport to Jamboree	-0.6	0.2	-0.9	-0.8	
Handy Creek					
Jamboree to SR-261	–	0.0	-2.0	-2.0	No
SR-261 to "A" Street	–	0.1	-3.0	-2.9	No
"A" St.					
Handy Creek to Culver Loop	--	0.1	-8.2	-8.0	
Culver Loop					
Santiago Canyon to "A" Street	–	0.3	-4.8	-4.4	
"A" Street to Culver	--	0.2	-6.7	-6.5	
Headlands					
Culver to "E" Street	--	0.2	-4.9	-4.7	
"C" Street					
"D" Street to Santiago Canyon	–	0.0	-2.1	-2.1	
Santiago Canyon to Headlands	–	0.2	-4.3	-4.1	
Headlands to Jeffrey	--	0.0	*1.4*	***1.4***	No
Jamboree Rd.					
South of Handy Creek	***3.2***	0.1	0.5	0.7	Yes
North of Tustin Ranch Rd	2.5	0.1	0.4	0.5	
Tustin Ranch Rd to Portola	1.9	0.1	0.4	0.5	
Culver Dr.					
Santiago Canyon to Headlands	–	0.2	-7.5	-7.3	
Headlands to SR-241	–	0.2	-6.1	-5.9	
SR-241 to Culver Loop	–	0.2	-8.9	-8.7	
North of Portola	–	0.0	-5.2	-5.2	
Culver Dr.					
South of Portola	***3.3***	0.0	-2.4	-2.4	
North of Irvine	0.2	0.1	-0.9	-0.7	Yes
Yale Av.					
Irvine to Bryan	2.2	0.9	0.1	0.9	Yes
Bryan to Trabuco	1.2	0.5	0.1	0.6	

Table 4-54
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change From Existing Levels	Change In Future Due To			Existing Res.?
		Project	NAPFP	Project + NAPFP	
Jeffrey Rd.					
"D" Street to Santiago Canyon	–	0.0	***1.2***	***1.2***	
Santiago Canyon to "C" Street	–	-0.1	***2.0***	***1.9***	
"C" Street to SR-241	–	-0.1	***1.2***	***1.1***	No
SR-241 to Portola	–	0.2	0.8	***1.0***	No
South of Portola	***6.8***	0.9	0.4	***1.3***	No
North of Irvine	***7.6***	***1.8***	0.3	***2.2***	No
Irvine to Bryan	***5.9***	***1.9***	0.2	***2.1***	Yes
Bryan to Trabuco	***5.8***	***1.6***	0.1	***1.7***	No
South of Trabuco	***4.3***	***1.6***	-0.1	***1.5***	No
North of I-5	***4.9***	***1.0***	-0.1	0.9	No
I-5 to Irvine Center Dr.	***3.4***	0.6	-0.1	0.5	Yes
Sand Canyon Av.					
South of Portola	***6.2***	***1.2***	0.5	***1.7***	No
North of Irvine	***8.1***	***3.3***	0.3	***3.6***	No
South of Irvine	***6.6***	***4.0***	0.4	***4.4***	No
North of Trabuco	***6.6***	***4.0***	0.4	***4.4***	No
Trabuco to Roosevelt	***6.5***	***1.9***	-0.2	***1.7***	No
Roosevelt to Road "B"	***6.8***	***1.2***	-0.3	***1.0***	No
Road "B" to I-5	***6.9***	0.9	-0.2	0.7	No
Research.					
Trabuco to Marine	--	0.2	***4.1***	***4.3***	No
Central Park W.					
Marine to Millennium	--	-0.1	-4.5	-4.6	
Millennium Bl.					
South of Portola	–	***4.4***	0.6	***5.0***	No
North of Irvine	–	***5.3***	0.6	***5.9***	No
Irvine to W. Culture	–	***2.3***	0.5	***2.8***	No
Trabuco to E. Culture	–	***1.2***	-2.6	-1.4	No
Millennium Bl.					
Central Park E. to Barranca	–	0.3	-3.3	-3.0	
North of Alton	–	0.3	-3.6	-3.3	
Alton to Rockfield	--	0.2	-3.2	-3.0	
Alton Pkwy.					
SR-241 to Commercentre	--	0.1	-0.9	-0.8	
Commercentre to Trabuco	–	0.1	-1.3	-1.2	
Trabuco to Irvine	–	0.0	***2.1***	***2.0***	No
Irvine to Fairbanks	***5.3***	0.3	0.4	0.7	No
Fairbanks to Toledo	***7.0***	0.3	0.5	0.7	No
South of Toledo	***3.1***	0.2	0.4	0.6	No
North of Jeronimo	2.7	0.0	0.6	0.7	

Table 4-54
Change in Traffic Noise CNEL Levels

Roadway & Segment	Change From Existing Levels	Change In Future Due To			Existing Res.?
		Project	NAPFP	Project + NAPFP	
Bake Pkwy.					
Millennium to I-5	-0.1	0.1	-1.0	-0.9	
South of I-5	***4.8***	0.1	-0.8	-0.7	No
North of Irvine Center Dr.	-0.8	0.2	-1.0	-0.8	
South of Irvine Center Dr.	–	0.0	-0.5	-0.5	
North of Lake Forest	–	0.0	-0.5	-0.5	
South of Lake Forest	--	-0.1	-0.4	-0.5	
Portola Pkwy.					
Culver to Yale	***5.8***	0.8	0.0	0.8	Yes
Yale to Jeffrey	***6.4***	0.9	-0.2	0.7	Yes
Jeffrey to Sand Canyon	***6.1***	***1.1***	-0.2	0.9	No
Sand Canyon to SR-133	***6.8***	***1.9***	0.2	***2.1***	No
SR-133 to Research	***6.7***	***2.0***	0.1	***2.1***	No
Research to Millennium	***5.6***	***1.1***	-0.5	0.6	No
East of Millennium	***7.1***	***2.1***	0.1	***2.3***	No
South of SR-241	***5.7***	0.5	0.3	0.9	No
North of SR-241	–	0.3	0.3	0.7	
West of Alton	***6.1***	0.2	0.3	0.5	Yes
Rancho					
Alton to Bake	--	0.0	-0.7	-0.6	
Irvine Bl.					
West of Culver	1.3	0.8	-0.1	0.7	
Culver to Yale	2.4	***1.0***	-0.1	0.9	Yes
East of Yale	***4.1***	***1.2***	-0.1	***1.1***	Yes
Irvine Bl.					
West of Jeffrey	***4.2***	***1.0***	-0.1	0.8	Yes
East of Jeffrey	***5.2***	***1.7***	-0.2	***1.5***	No
West of Sand Canyon	***4.1***	0.8	-0.3	0.5	No
Sand Canyon to SR-133	***3.5***	***1.1***	0.0	***1.0***	No
Central Park W. to Millennium	***3.6***	0.8	-0.2	0.6	No
Millennium to Connector	***4.7***	***1.0***	***1.2***	***2.1***	No
Connector to Central Park E.	***4.7***	0.8	0.8	***1.5***	No
Central Park E. to Trabuco	***4.7***	0.7	0.8	***1.6***	No
Trabuco to Alton	***4.6***	0.6	***1.1***	***1.6***	No
Bryan Av.					
Yale to Jeffrey	***3.6***	***1.0***	-0.1	0.9	Yes
Trabuco Rd.					
Collector St. to Road "C"	***8.7***	0.5	-1.3	-0.8	No
Road "C" Sand Canyon	***9.8***	0.5	-1.5	-1.0	No
Sand Canyon SR-133	–	0.6	-1.8	-1.3	
SR-133 to Research	–	0.3	-2.4	-2.2	
Research to Central Park W.	--	0.2	-2.6	-2.3	

Table 4-54 Change in Traffic Noise CNEL Levels					
		Change In Future Due To			Existing Res.?
Roadway & Segment	Change From Existing Levels	Project	NAPFP	Project + NAPFP	
Roosevelt Av. West of Sand Canyon	--	0.7	0.1	0.9	
Marine Wy. Sand Canyon to Research West of Research	– --	-0.1 -0.2	-0.4 -1.2	-0.5 -1.5	
Technology Dr. North of Laguna Canyon Road	--	0.1	0.4	0.6	
Barranca Pkwy. Ada to Millennium	1.7	0.1	-0.6	-0.5	
Rockfield Bl. Millennium to Bake	--	0.3	***1.4***	***1.6***	No
Laguna Canyon Rd. Sand Canyon to Technology Technology to Irvine Center Dr.	– --	0.3 0.2	0.2 0.2	0.5 0.5	
SR-261 SR-241 to Portola	***2.8***	0.1	0.5	0.5	Yes

Table 4-54 shows that the project combined with the "Probable Future Projects" will result in significant noise level increases (1 dB or greater) for three road segments. For two of these road segments, Jeffrey between Irvine and Bryan and Irvine east of Yale, it is the project that causes the significant increase. The "Probable Future Projects" do not significantly change the noise levels along these roadways. Along Irvine east of Yale, future noise levels will remain below the City's 65 CNEL noise standard at the residences as discussed in as previously discussed. The Long Term Off-Site Impacts section shows that the noise levels at the residences along Jeffrey between Irvine and Bryan will exceed the 65 CNEL standard and the project will result in a significant impact. Mitigation is discussed in Section 4.10.3 and will be required to reduce future ultimate noise levels to below 65 CNEL.

Along Yale between Irvine and Bryan the combination of the project and the "Probable Future Projects" will result in 1 dB of the 2.3 dB increase in traffic noise CNEL over existing conditions. There are residences located along the both sides of the roadway. There are noise barriers located between the roadway and all of the homes. These barriers are between 38 and 45 feet from the roadway centerline and between 5.3 and 6 feet high above the pad elevations. The homes have pads that range from 3 feet below to 5 feet above roadway grade. Noise modeling including the effect of the noise barriers shows that the worst-case future with project noise levels will remain below 65

CNEL. Therefore the project in combination with the "Probable Future Projects" will not result in a significant noise impact at these homes.

Table 4-54 shows that nine roadway segments will experience significant noise increases over existing conditions (3 dB or greater) with the combination of project, "Probable Future Projects" and all other growth in the area. All of these increases are significant with either the project or the "Probable Future Projects" and not due to the combination.

Jamboree south of Handy Creek, and SR-261 between SR-241 and Portola, and between Portola and Irvine will experience a significant increase over existing conditions due to the "Probable Future Projects". The increases along these segments with the "Probable Future Projects" but without the project would still be significant. Further, the increases with the project but without the "Probable Future Projects" are not significant. The project contributes 0.1 dB or less to the total increases along these roadway segments.

The remaining six roadway segments, Culver South of Portola, Jeffrey from I-5 to Irvine Center Drive, Portola from Culver to Yale, Portola from Yale to Jeffrey, Portola West of Alton and Bryan from Yale to Jeffrey, are significant with the project alone. These segments are discussed above in in previous sections. In fact for all but one of these segments the "Probable Future Projects" result in a slight reduction in traffic noise levels. Along Portola Parkway west of Alton the "Probable Future Projects" causes only 0.3 dB of the 6.1 dB increase over existing conditions. The combination of the project and the "Probable Future Projects" contributes only 0.5 dB to the total increase. The contribution of the project and the "Probable Future Projects" to the total increase is not significant.

With Oak Canyon Over Crossing

As Laguna Canyon Road crosses Sand Canyon to the west it becomes Oak Canyon Road. Under the currently adopted roadway network Oak Canyon would not cross over the I-5 freeway at this point. This was used to calculate the noise level changes presented in Section 2.3.1. Table 4-55 presents the noise level changes if Oak Canyon Road crossed over the I-5 freeway connecting to Road "A" north of the freeway. Table 4-55 presents the roadway segments that will have future (2025) with project noise levels affected by the potential over crossing of the I-5 freeway by Oak Canyon Road.

The first column of Table 4-55 lists the roadway segments. The second column shows change in existing CNEL noise levels in the Year 2025 with the project and the Oak Canyon over crossing. The next three columns show the contributions to this increase due to the project, Oak Canyon over crossing and the combined increase due to the project and the over crossing. The final column shows if residential uses currently exist adjacent to the roadways with significant noise increases. Significant noise increases are shown in bold italics.

Table 4-55 shows that the Oak Canyon over crossing does not significantly alter noise levels along any roadways. There is only one roadway segment where the combination of the project and the Oak Canyon over crossing result in a significant noise increase and there are existing residences, Trabuco from Yale to Jeffrey. This roadway segment is potentially significantly impacted by the project under the 2025 Constrained scenario as previously discussed. Detailed calculations showed that worst-case future noise levels at homes along this segment of roadway will be below 65 CNEL with the existing noise barriers. Therefore, no significant impact will occur.

The only roadway with a significant increase over existing conditions and existing adjacent residential is Jeffrey Road between I-5 and Irvine Center Drive. As discussed in General Plan Build-Out, future noise levels at the homes along this road segment will be below 65 CNEL and the project combined with the Oak Canyon over crossing will not result in a significant noise impact.

Table 4-55
Change in Traffic Noise CNEL Levels
with Oak Canyon Overcrossing

Roadway & Segment	Change From Existing Levels	Change In Future Due To			Existing Res.?
		Project	Oak Canyon OC	Project + Oak Canyon OC	
"A" St.					
Handy Creek to Culver Loop	--	0.1	-0.1	0.1	
Yale Ct.					
South of Portola	2.0	0.1	-1.0	0.1	
Yale Av.					
Walnut to Irvine Center Dr.	0.0	0.1	-0.1	0.0	
Jeffrey Rd.					
SR-241 to Portola	–	0.2	0.1	0.3	
North of I-5	***4.9***	***1.0***	-0.1	0.9	No
I-5 to Irvine Center Dr.	***3.3***	0.6	-0.1	0.5	Yes
Sand Canyon Av.					
Road "B" to I-5	***6.9***	0.9	-0.2	0.8	No
I-5 to Oak Canyon	***5.2***	0.5	-0.2	0.3	No
Oak Canyon to Irvine Center Dr.	***4.6***	0.5	-0.1	0.4	No
Central Park W.					
W. Culture to Trabuco	--	***2.3***	0.1	***2.4***	No
E. Culture					
Connector to Trabuco	–	0.3	0.3	0.7	
W. Culture					
Central Park W. to W. Culture	–	***1.8***	0.3	***2.0***	No
W. Culture to Millennium	–	0.8	0.2	***1.0***	No
Trabuco to Millennium	--	0.0	-0.2	-0.2	
Connector					
Irvine to E. Culture	–	-0.2	0.1	-0.1	
Bake Pkwy.					
North of Irvine Center Dr.	0.1	0.2	-0.1	0.1	
Portola Pkwy.					
Jeffrey to Sand Canyon	***6.2***	***1.1***	-0.1	***1.1***	No
Trabuco Rd.					
East of Culver	0.5	0.4	-0.1	0.3	
Yale to Jeffrey	***8.7***	0.9	0.1	***1.0***	Yes
Jeffrey to Road "A"	***11.7***	0.7	0.1	0.8	No
Collector St. to Road "C"	***9.9***	0.5	-0.1	0.5	No
Road "C" Sand Canyon	***11.2***	0.5	-0.1	0.4	No

Table 4-55
Change in Traffic Noise CNEL Levels
with Oak Canyon Overcrossing

Roadway & Segment	Change From Existing Levels	Change In Future Due To: Project	Change In Future Due To: Oak Canyon OC	Change In Future Due To: Project + Oak Canyon OC	Existing Res.?
Roosevelt Av.					
East of Jeffrey	–	0.0	0.2	0.2	
West of Sand Canyon	--	0.7	-0.7	0.0	
Road "B"					
Road "A" to San Canyon Rd.	–	-0.1	-0.4	-0.5	
Technology Dr.					
North of Laguna Canyon Road	--	0.1	0.2	0.3	
Irvine Center Dr.					
Jeffrey to San Canyon	***3.4***	0.1	-0.1	0.0	No
Laguna Canyon Rd.					
Sand Canyon to Technology	–	0.3	0.3	0.6	
Technology to Irvine Center Dr.	–	0.2	0.2	0.4	
Irvine Center Dr. to Barranca	***5.8***	0.2	0.1	0.3	No
Barranca to Alton	***6.2***	0.2	0.1	0.2	No

4.10.3 MITIGATION MEASURES

Existing Regulations and Standard Conditions

10.1 Prior to the issuance of building permits for each structure or tenant improvement other than a parking structure, the landowner or subsequent project applicant shall submit a final acoustical report prepared to the satisfaction of the Director of Community Development. The report shall show that the development will be sound-attenuated against present and projected noise levels, including roadway, aircraft, helicopter and railroad, to meet City interior and exterior noise standards. The final acoustical report shall include all information required by the City's "Acoustical Report Information Sheet" (form 42-48). In order to demonstrate that all mitigation measures have been incorporated into the project, the report shall be accompanied by a list identifying the sheet(s) of the building plans which include the approved mitigation measures. (Standard Condition 3.1.)

Project Design Features/Special Development Requirements

No project design features or special development requirements related to noise are proposed

Additional Mitigation Measures

10.2 Prior to issuance of grading permits, the landowner or subsequent project applicant shall incorporate the requirements of the Noise Ordinance as a note on the grading plan cover sheet, for review and approval by the Director of Community Development. Section 6-8-205 limits construction related activities to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, and between 9:00 a.m. and 6:00 p.m. on Saturday, and prohibits work on Sundays and holidays, unless prior approval is received from the City of Irvine. In addition, the Noise Ordinance requirements shall be discussed at the pre-grade meeting, and implemented during construction.

10.3 Prior to issuance of each grading permit, the landowner or subsequent project applicant shall incorporate the following measures as a note on the grading plan cover sheet to ensure that the greatest distance between noise sources and sensitive receptors during construction activities has been achieved. This language shall be approved by the Director of Communit Development.

a. Construction equipment, fixed or mobile, shall be maintained in proper operating condition with approved noise mufflers.

b. Construction staging areas shall be located away from off-site receptors and occupied buildings on site during the later phases of project development.

c. Stationary equipment shall be placed such that emitted noise is directed away from residential areas to the greatest extent feasible.

d. Construction access routes shall be selected to minimize truck traffic near existing residential uses where reasonably feasible.

10.4 Prior to issuance of building permits for the 3750th residence, a noise barrier shall be constructed on the west side of Jeffrey Road between Irvine Boulevard and Bryan Avenue that will reduce future worst-case with project noise levels to below 65 CNEL at existing residential areas. Prior to construction of the wall a detailed study should be performed by a qualified acoustical consultant to determine the specific height and location of the noise barrier required to reduce future worst-case with project noise levels to below 65 CNEL. This study shall be submitted to and approved by the City prior to construction of the noise barrier.

10.5 Any specific uses that are capable of generating significant noise shall be located away from existing or future residential areas. Prior to the issuance of building permits for each Planning Area, detailed noise studies shall be required for any potentially noise generating uses as determined by City staff. These studies shall describe the noise levels generated by the use and show compliance with the City's Noise Ordinance Standards.

4.10.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the existing policies and standard conditions of approval and the mitigation measures listed above will reduce all potential short-term and long-term noise impacts to a less than significant level. While cumulative noise level increases may be perceptible, in-place and planned mitigation will reduce significant cumulative noise impacts to an acceptable level.

4.11 Population and Housing

4.11.1 ENVIRONMENTAL SETTING

The proposed project is located in the City of Irvine's Northern Sphere Area, within Planning Areas 3, 6 and 9 and portions of Planning Areas 2, 5 and 8. Planning Area 3 and Implementation District "P" within Planning Area 2 are designated on the City's General Plan as Open Space and will remain open space; the proposed project will not change this designation. Currently, the project area is situated in the unincorporated portion of the County of Orange, which lies within the City of Irvine's northern sphere of influence. The project area is zoned primarily as conservation and open space reserve.

Local and Regional Population, Housing and Employment

The project area's demographics are best examined in the context of existing and projected population for the Orange County region and the City of Irvine. Information on population, housing and employment for the project area is available from several sources:

U.S. Census Data

The United States Bureau of the Census publishes population, household and employment data gathered through the decennial census. This data provides a record of historic growth rates in Orange County and the City of Irvine. U. S. Census 2000 results are now being released. Table 4-56 below presents Orange County's population, housing and employment and its rate of growth since l980. Table 4-57 presents Irvine's population, housing and employment and its rate of growth since l980.

Table 4-56
Orange County Population, Housing and Employment, 1980-2000

	1980	1990	2000
Population	1,932,709	2,410,556	2,846,289
Households	721,514	875,072	969,484
Employment	847,793*	1,301,235**	1,502,434***

Source: U. S. Decennial Census
* *Orange County Progress Report, July l980 estimate*
** *Composite of Census and California Employment Development Department estimates, OCP-92.*
*** *2000 Census data not yet available; estimate from OCP-2000 controlled to California Employment Development Department Labor Force estimate, June 2000.*

Table 4-57 City of Irvine Population, Housing and Employment, 1980-2000			
	1980	**1990**	**2000**
Population	62,134	109,706	143,072
Households	22,514	42,221	53,711
Employment	68,741*	152,441**	176,986***

Source: U. S. Decennial Census
* *Orange County Progress Report, June 1980 estimate*
** *Composite of Census and California Employment Development Department estimates, OCP-92.*
*** *2000 Census data not yet available; estimate from OCP-2000 controlled to California Employment Development Department Labor Force estimate, June 2000.*

Orange County Projections

Orange County jurisdictions and public agencies develop demographic estimates and projections to provide a common foundation for regional and local planning, policymaking, and infrastructure provision. Orange County agencies have executed a Memorandum of Understanding with the Orange County Council of Governments (OCCOG) to contract with the Center for Demographic Research at California State University, Fullerton, to develop and periodically update demographic projections for Orange County. OCCOG adopted the most recent projections, entitled Orange County Projections 2000 (OCP-2000), at the Jurisdiction, Regional Statistical Area, Community Analysis Area, and Census Tract levels. In addition, the Center for Demographic Research and the Orange County Transportation Authority distribute OCP-2000 projections to small geographic areas called Traffic Analysis Zones (TAZs) for small scale planning purposes. For example, OCP-2000 TAZs can be aggregated to approximate the boundaries of the proposed project.

OCP-2000 provides the best available projection of anticipated growth for Orange County. OCP-2000 projects the amount and distribution of population, housing and employment growth based on detailed information about growth trends, development and local land use provided by Orange County jurisdictions and public agencies; infrastructure, utility and service providers; and the private sector. The process for developing the projections is described in "Orange County Projections 2000." (California State University, Fullerton, Center for Demographic Research, September, 2000).

The OCP-2000 projections for 2000 correlate closely with the 2000 U.S. Census results released to date. Orange County's 2000 census population is within 1.2% of the OCP-2000 figure. The City of Irvine's OCP-2000 population for 2000 varies less than 1% from the census count. Likewise, both Irvine's and Orange County's census housing counts are less than 1% below OCP-2000. Direct comparisons of employment projections are not possible at this time, as 2000 Census employment

estimates will not be released until 2003. In the interim, the Center for Demographic Research adjusts OCP projections to reflect California Employment Development Department employment projections.

Table 4-58 presents OCP-2000 projections for Orange County and City of Irvine population, housing and employment for the 2000 through 2025 period.

Table 4-58
OCP-2000 Projections for Orange County and the City of Irvine, 2000-2010

	2000	2005	2010	2015	2020	2025
Population						
County	2,853,757	3,031,440	3,168,942	3,270,677	3,342,829	3,416,037
Irvine	144,802	173,182	179,836	182,933	192,836	194,913
Dwelling Units						
County	978,004	1,018,873	1,056,882	1,080,430	1,096,824	1,115,823
Irvine	53,750	63,200	64,904	66,686	68,439	68,883
Employment						
County	1,502,434	1,667,778	1,796,726	1,897,350	1,975,074	2,043,665
Irvine	176,986	209,464	227,879	248,731	252,940	261,309

Source: OCP-2000, adopted by the Orange County Council of Government, June 2000
Note: Projections are for July, 2000, 2005, 2010, 2015, 2020, and 2025.

Regional Projections

OCP-2000 projections are submitted as Orange County's input to regional growth projections prepared for the six-county Southern California region by the Southern California Association of Governments (SCAG). OCP-2000 provided the background for SCAG's adopted 2001 Regional Forecast for Orange County which is similar, but not identical, to OCP-2000 for 2025. SCAG's regional forecast modifies the OCP-2000 growth distribution to reflect regional transportation and housing policies, and is not constrained by local general plans to the extent that OCP-2000 is.

Population: Historic trends, existing population and current projections

Orange County Population

Population growth in Orange County has maintained a strong but diminishing pace in recent decades. From l980 to l990, population increased 47,785 annually, slowing to an average annual increase of 43,573 people during the l990s. Orange County's current population is 2,846,289 as reported by the 2000 Census.

Based on Orange County's historic share of California's and the region's employment growth; migration and immigration trends; fertility rates; and local General Plans and zoning, OCP-2000 projects that this trend will continue at a diminished rate, with the County growing by an average of 22,491 people per year, from 2000 to 2025. Population growth will be fueled in large part by natural increase. Births are expected to account for 85% of the County's future population growth County (The Orange County Planner, August/September 2001).

City of Irvine Population

The City of Irvine mirrors the County's growth. During the l980's the City's population increased 77 %, an annual average increase of 4,757 people. This rate cooled in the l990s, yielding a 30% increase (3,337 annual average increase) over the decade. The 2000 Census reports that the City's current population is 143,072.

OCP-2000 projects how population growth within the County will be distributed over the next 25 years. OCP-2000 projects an annual average population increase of 2,004 between 2000 and 2025. In 2000, the City of Irvine's population represented 5.07% of the total County population. In 2025, this proportion is projected to climb to 5.71%.

Project Area Population

The project area has been designated mainly for agriculture, development reserve and conservation open space reserve, and has thus not experienced significant population growth to date. The City's General Plan allocates 263 dwelling units in Planning Area 6.

Housing: Historic trends, existing housing, and current projections

Orange County Housing

Housing growth in Orange County has not matched the pace set by population growth. From l990 to 2000, Countywide households increased 11% at an annual average rate of 9,441 units.

At present, Orange County has 969,484 households, with 2.9 persons per household on average. Sixty one and a half percent (61.5%) of the County's housing stock is single family units. (2000 Decennial Census) The California Department of Finance estimates the January 2001 vacancy rate at 3.52%. As approved with input from local jurisdictions, OCP-2000 projects that the County's housing stock will increase by 137,819 units (14.1%) by 2025, an average rate of 5,513 dwelling units per year. Thus, the number of persons per household is projected to rise slightly to accommodate a population that is growing faster than the housing stock.

City of Irvine Housing

The City of Irvine reflects the County's housing growth. During the 1990s, the City's housing increased 27%, at an annual average rate of 1,149 units. By 2025, OCP-2000 projects a 28% increase of 15,133 units (an average of 605 units per year) -- a housing growth rate half that experienced during the 1990s. In 2025, the City's housing units would grow to 6.2% of the County total despite the projected slowdown in housing production rates.

Table 4-59 summarizes the City's current housing stock. In 2000, the City of Irvine's dwelling units represented 5.5% of the total County housing stock. The City's housing stock is 64% single family units, compared with 61% countywide. The January 2001 vacancy rate is 4.68%, above the countywide rate of 3.52% estimated by the California Department of Finance. The City's 2000-2005 Housing Element defines 3.1% as an optimal vacancy rate.

Table 4-59
City of Irvine 2000 Housing Units by Type

	Units	Percent of Total Units
Single Family Detached	20,191	39.7%
Single Family Attached	12,262	24.1%
Multi-Family, 2-4 Units	3,084	6.1%
Multi-Family, 5 or More Units	14,307	28.1%
Mobile Homes	1,000	2.0%
Total Units	**50,844**	**100.0%**

Source: California Department of Finance, January 2000 estimate.
Note: 2000 Census details on housing units by type is not yet available.

Housing affordability and availability have become major housing policy issues within the City, region and state. The City of Irvine prepared the 2000-2005 Housing Element of its General Plan

to provide a long-term blueprint for housing within the context of local and regional trends and housing production and housing affordability goals.

Housing affordability is a function of income and housing cost. Housing costs in Irvine have escalated steeply in recent years. Median home sales prices in the City ranged from $304,000 to $337,000, depending on zip code, as of August 2001 (DataQuick, August 2001). The City of Irvine's Housing Element adopted the objective of increasing affordable housing opportunities through new construction, and establishes a citywide Affordable Housing Needs goal of devoting 5% of units built for households earning less than 50% of the County's median family income, 5% of units built for households earning 51 to 80% of the County's median family income, and 5% of units for households earning 81 to 120% of the County's median family income. These goals may be satisfied through on-site or off-site construction based on the availability of financial incentives (City of Irvine, 2000-2005 Housing Element, November 2000.)

The Housing Element notes that the Affordable Housing Needs goal and implementation programs are needed to meet new production targets set by California's Department of Housing and Community Development to encourage each jurisdiction in the state to provide its fair share of very low, low and moderate income housing needed during the 2000-2005 time period. These numerical housing production goals are known as Regional Housing Needs Assessment (RHNA) targets. State law requires that the Housing Element of the General Plan identify RHNA targets and document programs designed to meet the targets. To this end, the Housing Element analyzes housing needs within the City's demographic context; reviews potential market, governmental, and other constraints to meeting the City's housing needs; evaluates the resources available to meet housing needs; and finally, establishes policies and objectives to make progress in meeting its housing needs during the five-year period. The Department of Housing and Community Development is in the process of reviewing and certifying the City's Housing Element.

Irvine's Housing Element contains a package of goals, objectives and policies designed to meet its 2000-2005 RHNA targets as well as other housing needs in the City. Table 4-60 below recaps the City of Irvine's RHNA goal of providing 10,782 additional units to meet the needs of very low, low, moderate and upper income households in the City.

Table 4-60 City of Irvine Regional Housing Needs Assessment Targets, 2000-2005	
Household Income Category	**Target**
Very Low Income 1,2	1,942 units
Low Income 3	1,186 units
Moderate Income 4	2,049 units
Upper Income	5,605 units
Total	10,782 units
0-50% of Area Median Family Income (MFI) *51-80% of MFI* *81-120% of MFI* *Greater than 120% of MFI* *Source: City of Irvine, 2000-2005 Housing Element, November 2000.*	

Project Area Housing

Currently, the General Plan allocates 263 dwelling units to the Northern Sphere Area within Planning Area 6.

Employment: Historic trends, existing employment and current projections

Orange County Employment

From 1990 to 2000, Countywide employment increased 15.1%, an average of 19,734 jobs annually. As of June 2000, Orange County has 1.5 million jobs. California's Employment Development Department estimates the current unemployment rate at 2.5%. OCP-2000 projects the County will continue to grow by 541,231 jobs, an average of 21,649 jobs per year through 2025. This constitutes a 36% increase over the twenty-five year period.

City of Irvine Employment

The City of Irvine's employment increased 16% during the 1990s, with an annual average increase of 2,555 jobs. The City's 2000 employment base was 176,986 jobs. The City's resident labor force is composed of 71,280 workers, with an unemployment rate of 1.9% (California Employment Development Department, June 2000). The City of Irvine estimates that 13% of these workers both reside and work within the City. (GPA 40 EIR: Larson, City of Irvine, 2000). Universities, bio-medical and high technology firms are the largest employers within the City.

OCP-2000 projects a 48% employment increase of 84,323 jobs, an annual average increase of 3,373 jobs between 2020 and 2025. In 2000, the City of Irvine's employment represented 11.8% of the total County employment. In 2025, Irvine is projected to garner 12.8% of county employment.

Project Area Employment

At present, jobs located within the project area are related to agriculture and nursery businesses. OCP-2000 estimates existing employment in the project area at 1,694. This employment base fluctuates seasonally. With respect to crop farming and nursery operations, a small number of year-round employees is supplemented with seasonal workers during harvests.

Adjustments to the OCP-2000 Base Year Projections

The Orange County Council of Governments (OCCOG) adopted OCP-2000 in June, 2000. The Center for Demographic Research is in the process of preparing interim revisions to OCP-2000 to reflect changes in the projections necessitated by recent General Plan Amendments. Final interim revisions to OCP-2000 are expected to be completed by December 2001.

Among the updates requested by local jurisdictions, the Center for Demographic Research will consider adjustments to OCP-2000 for RSA E-44 in which the proposed project is located. Since June 2000, a number of projects have been approved in the proposed project vicinity. Three General Plan Amendments have occurred in the City of Irvine since OCP-2000 was adopted: Spectrum 8, Planning Area 17, and Planning Area 27. (S. Keyes, City of Irvine, September 2001).

In addition to these General Plan Amendments, the County of Orange is requesting adjustments to zones throughout the unincorporated area that would impact RSA E-44, as well as other RSAs in southern Orange County. The County is requesting the adjustments to correct data transmission errors. Table 4-61 summarizes requested adjustments to OCP-2000 projections for RSA E-44 and the City of Irvine.

Table 4-61 Requested Changes to OCP-2000 2025 Projections for RSA E-44 and the City of Irvine		
	Dwelling Unit Adjustment	**Employment Adjustment**
City of Irvine	300	248
Unincorporated Area	3,167	13,656
% Adjustment to RSA E-44	3.90%	4.11%
Source: Center for Demographic Research, October 2001.		

4.11.2 ENVIRONMENTAL IMPACTS

Thresholds of Significance

The CEQA Environmental Checklist, Appendix G of the CEQA Guidelines, identifies three thresholds for determining significant population and/or housing impacts associated with a proposed project. A significant impact would occur if the proposed project:

- Induces substantial population growth in the area, either directly (for example by proposing new homes and businesses, or indirectly (for example through extension of roads or other infrastructure);

- Displaces substantial numbers of existing housing necessitating the construction of replacement housing elsewhere; or

- Displaces substantial numbers of people, necessitating the construction of replacement housing elsewhere.

The discussion which follows focuses on the first criterion of significance only, as no housing or population will be displaced by the proposed project.

Methodology and Criteria for Determining Impacts

The proposed project is located within the City of Irvine's sphere of influence, within the unincorporated portion of the County of Orange. This discussion compares the new jobs and homes associated with the proposed project to the amount and distribution of growth anticipated in adopted projections, plans and policies that address the future of the project area. Determination of the proposed project's employment, housing and population impacts will be based on a combination of quantitative and qualitative factors set forth in the following adopted plans and policies:

OCP-2000 Projections: OCP-2000 growth projections present demographic projections for Orange County cities and unincorporated areas, for five year intervals from 2000 through 2025. Adopted in June, 2000, OCP-2000 is a consensus forecast that incorporates the latest population, housing and employment information provided by local jurisdictions and their general plans, public agencies, and service providers.

OCP-2000 allows the proposed project's potential impact on population, housing and employment to be viewed in a county, subregional, and city context. This capability is particularly important when examining the project's likely impact on the balance between jobs and housing.

OCP-2000 was adopted at the County, subregional, city and census tract levels. For planning and modeling purposes, the projections have also been split into geographic units smaller than census tracts, called Transportation Analysis Zones (TAZs), with the assistance of the County and cities. These zones have been aggregated to reflect the proposed project area as closely as possible to direct comparison of the proposed project with OCP-2000. A portion of one TAZ extends beyond the proposed project's boundary. As a result, OCP-2000 population, housing and employment estimates cited in this discussion for the proposed project are slightly overstated.

OCP-2000 reflects the City of Irvine General Plan within the corporate boundaries. OCP-2000 assumes development of a commercial airport on the former MCAS El Toro site. Thus, comparison of the proposed project to OCP-2000 results in an assessment of the project's individual effects as well as its cumulative impact together with development of a commercial airport on the El Toro site.

State, Regional and City Plans and Policies: While OCP-2000 provides one method of evaluating the proposed project's socio-economic impacts, state, regional and local plans and policies provide guidance that should be considered and balanced with a purely quantitative comparison of the project to OCP-2000 projections.

Thus, the proposed project will be evaluated in light of the following key state, regional and local plans, policies, and requirements that address various aspects of future population, housing and employment growth:

> **State of California Fair Share Housing Requirements.** California State housing law calls upon local jurisdictions to shoulder their fair share of very-low, low, and moderate income housing. In implementing this law, California's Department of Housing and Community Development (HCD) assigns fair share housing targets to each jurisdiction, and requires local General Plan Housing Elements to address how these fair share housing targets can be achieved during the 2000-2005 time frame given local demographics, land use and zoning. State law requires local jurisdictions to submit Housing Elements for HCD review and approval. New targets will be set for subsequent 5-year increments.

Regional Growth Management Policies. The Southern California Association of Governments (SCAG) is recognized by the state and federal governments as the regional planning agency for the six-county south coast region that includes Orange County. SCAG adopted a package of advisory growth policies in its l995 Regional Comprehensive Plan and Guide. The policies aim to better coordinate infrastructure development with projected population, housing and employment growth. In its efforts to develop a regional transportation network that maximizes access and mobility, minimizes congestion and protects the quality of life, the Southern California Association of Governments (SCAG) focuses particular attention on the relationship between jobs and housing.

SCAG policies encourage job and housing opportunities to be balanced at the Regional Statistical Area, which is larger than the project level. SCAG policies also encourage job growth to be concentrated near transit services and transit nodes, and near existing freeways and toll roads in order to reduce Vehicle Miles Traveled (VMT) and congestion, and the air pollution that accompany them.

The following RCPG jobs and housing growth policies are relevant to the proposed project:

> 3.04 Encourage local jurisdictions' efforts to achieve a balance between the types of jobs they seek to attract and housing prices
>
> 3.11 Support provisions and incentives created by local jurisdictions to attract housing growth in job-rich subregions and job growth in housing-rich subregions.
>
> 3.12 Encourage programs aimed as designing new land uses which encourage the use of transit and thus reduce the need for roadway expansion, number of auto trips and miles traveled and create opportunities for residents to walk and bike.
>
> 3.14 Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems and activity centers.
>
> 3.15 Support local jurisdictions' strategies to establish mixed-use clusters and other transit-oriented development around transit stations and transit corridors.
>
> 3.16 Encourage developments in and around activity centers, transportation corridors, under-utilized infrastructure systems and areas needing recycling and redevelopment.

City of Irvine General Plan. The City of Irvine General Plan provides a blueprint for growth and development within the corporate boundaries and sphere of influence. While OCP-2000 projects the distribution of population, housing and employment growth between

2000 and 2025, the City's General Plan focuses on the amount of growth at build-out. The City's General Plan includes four recently approved projects in the proposed project vicinity:

- Spectrum 8: This project will add commercial/industrial square footage that could result in up to 26,187 new jobs in the existing Spectrum employment concentration, based on City of Irvine conversion factors.

- Planning Area 17: This mixed use project adds 2,344 jobs and 2,375 housing units

- Planning Area 27: This residential project adds 157 jobs and 2,155 housing units

- Millennium Plan II: The City of Irvine's adopted plan for the former MCAS El Toro site, this project includes 30-35,000 jobs onsite as well as 3,261 housing units.

Thus, comparison with the City's General Plan provides an assessment of the project's individual effects as well as its cumulative impact in combination with other recently approved projects, including Millennium Plan II development of the former MCAS El Toro site.

Three components of the City of Irvine General Plan are particularly relevant to assessing the potential growth impacts of the proposed project, as discussed below.

City General Plan Amendment 16, adopted in 1988, established an open space program and allocated housing and employment development opportunities within the City and its sphere of influence, including the proposed project area. GPA 16 was predicated on a citywide jobs/housing ratio of 3.66 at build-out, resulting from its allocation of housing and employment growth. This jobs-rich condition was identified as a consequence of four major regional job concentrations within the City and its sphere: MCAS El Toro, UC Irvine, Irvine Business Center, and Spectrum.

City NCCP Housing Bank. The Natural Community Conservation Program agreement establishes an NCCP Housing Bank of 4,233 units. The NCCP agreement provides that these units, which were originally projected to be built in the conservation area under GPA 16, may be approved for construction elsewhere in the City or its sphere, which includes the proposed project area.

City of Irvine 2000-2005 Housing Element identifies policies designed to carry out the state, regional and local general plan policies described above in the current socio-economic context. Housing Element policies relevant to the proposed project address the need for affordable housing, as well as housing in all planning areas to foster better jobs/housing balance;

Objective C-1, New Construction

Increase affordable housing opportunities through new construction.

Policy C-1 (a), Affordable Housing Needs Goal

In order to achieve the Regional Housing Needs Allocation (RHNA), the city has established the following minimum housing production objectives:

- *5% for households earning less than 50% of the HUD County Median Family Income (Income I and II) satisfied through development of rental or ownership housing with financial incentives. . .*

- *5% of the actual number of units built in the planning area shall be affordable as either rental or ownership units, with the emphasis on ownership units, for households earning between 51% and 80% of the HUD County Median Family Income (Income III) contingent upon the provision of financial incentives. . .*

- *5% for households earning 81 to 120% of the HUD County Median Family Income (Income IV) satisfied by development of ownership housing.*

Policy C-1 (e), Balanced Land Use.

Develop adequate housing opportunities in each planning area, at the time of City's RHNA [Regional Housing Needs Assessment] goal. In addition, promote a diversity of housing types and affordability to address the housing development needs generated by new development in the City.

2000-2005 Objectives: Strive to improve the City's jobs-to-housing relationship, including matching type and price of housing to need generated by employment.

Balanced Employment/Residential Growth Objective C-8: *Provide a range of housing opportunities to allow persons working in Irvine to also reside in the City.*

Zoning Incentives for Mixed Use, Policy (c*): Encourage commercial/residential projects and live/work space through use of incentives.*

Evaluation of Employment, Housing and Population Impacts

The proposed project will result in population, housing and employment growth as summarized in Table 4-62. This level of growth reflects the City of Irvine's latest growth factors for single family

and multi-family development, as well as office, retail, service, research and development uses and school facilities.

Table 4-62
Population, Housing and Employment of Proposed Project at Build-Out

Planning Area	Dwelling Units	Population	Employment
5B	1,900	5,636	213
6	4,500	12,847	6,442
8A	400	1,181	0
9	5,550	15,179	11,012
Total	12,350	34,843	17,667*

Source: Austin Foust Associates, August 2001.
** 1,694 existing jobs will be replaced for a net employment increase of 15,973 jobs.*

Table 4-63 below compares growth captured by the proposed project with OCP-2000 projections for the area. To ensure both a regional and local perspective, the most recent adopted OCP-2000 projections for the City, County and Regional Statistical Area (RSA) are included. RSA E-44 figures are included as an indicator of growth at the subregional level addressed in regional growth policies.

Table 4-63
Proposed Project Net Growth Compared with Orange County, City of Irvine, and RSA-E44

	2000	2025
Population		
County	2,853,757	3,416,037
RSA E-44	165,226	249,044
Irvine	144,802	194,913
OCP-2000 TAZ	5,509	18,173
Proposed Project	0	34,833
Dwelling Units		
County	978,004	1,115,823
RSA E-44	61,095	88,441
Irvine	53,750	68,883
OCP-2000 TAZ*	1,967**	6,367**
Proposed Project	0	12,350
Employment		
County	1,502,434	2,043,665
RSA E-44	170,046	341,921
Irvine	176,986	261,309
OCP-2000 TAZ	1,694	24,010
Proposed Project	1,694	17,667

** A portion of these TAZs lie outside the project area.*
*** OCP-2000 housing numbers reflect a 4% vacancy rate.*

Source: OCP-2000, adopted by the Orange County Council of Government, June 2000
Note: Projections are for July, 2000, 2005, 2010, 2015, 2020, and 2025.

Employment Growth Impacts

The proposed project will generate short-term construction jobs during the build-out period, as well as long-term employment. Specific short-term construction employment projections are not available for the project at this level of detail. Construction jobs will be generated over the life of the project, varying from site to site as the components of the project are implemented. In the long-term, project-related jobs will replace agricultural jobs currently located in Planning Areas 5B, 6, 8A, and 9 contained in the proposed project.

Comparison of the project to OCP-2000 Employment Projections: The proposed project will result in 17,667 regular full-time jobs by 2025 based on the amount of development and City of Irvine employment generation factors. A total of 1,694 agriculture-related jobs, which currently exist on the site according to OCP-2000, will be gradually phased out as the proposed project is constructed, for a gain of 15,973 net new jobs. OCP-2000 small area projections locate 24,010 jobs in the proposed project area. The proposed project's net job growth is completely covered by OCP-2000 projections for 2025, absorbing 67% of the allotted employment growth.

The Project Compared with Plans and Policies: The City of Irvine's General Plan identifies the amount of employment-generating development allowed within each planning area. The Irvine General Plan does not currently provide a commercial/industrial square footage allowance for Planning Areas 5B, 6, 8A, and 9 in the Irvine General Plan.

However, the employment growth associated with the proposed project provides fiscal balance to the project, while responding to regional policies that aim to improve regional jobs/housing balance. The proposed project's employment component would concentrate jobs and help balance considerable future housing growth slated for Regional Statistical Areas D-40 and C-43 in south Orange County. These two RSAs include all of south Orange County outside of the Irvine Ranch. Based on OCP-2000, the south county areas are expected to remain housing rich through 2025, with a jobs/housing ratio of 1.05 in RSA C-43 and 1.28 in RSA D-40. These jobs/housing ratios are well below the projected countywide ratio of 1.83 in 2025. Employment concentration and improved jobs/housing balance due to the proposed project will result in shorter home-to-work commutes in south Orange County, and provide a critical mass of jobs for transit and ridesharing programs that reduce congestion and air pollution.

Summary of Employment Impacts:

- The proposed project does not result in an impact in the context of OCP-2000 regional growth projections. The proposed project captures only 67% of OCP-2000 employment growth expected for the project area in 2025.

- The proposed project exceeds City General Plan allowances for employment-generating uses within Planning areas 5B, 6, 8A, and 9.

- The proposed project addresses regional policies that direct employment growth to areas near transportation and transit corridors, and to employment concentrations because of their ability to reduce travel, congestion and emissions.

Housing Growth Impacts

The proposed project will result in construction of 12,350 housing units within the City of Irvine. 12,087 single family detached, condominium, and apartment units would be added to 263 units already allocated to Planning Area 6 in the General Plan, for a total of 12,350 units by 2025. Table 4-64 summarizes the proposed project's share of the City and County's total housing stock.

Comparison of the Project to OCP-2000: OCP-2000 projects housing growth of 15,133 units within the City of Irvine over the next twenty-five years. 6,367 of these units are allocated to the small zones that make up the proposed project area. Thus, 42% of the housing units included in the proposed project are anticipated by OCP-2000. The remaining 5,983 units included in the proposed project are not reflected in the small area distribution of OCP-2000.

Table 4-64
Increase in Housing With the Proposed Project, 2000-2025

	City of Irvine	County of Orange
Dwelling Units in 2000	53,750	978,004
Dwelling Units Added by the Project	12,350	12,350
Project Increase over 2000	23%	1.3%
OCP-2000 Projection for 2025	68,883	1,115,823
Project as a Percentage of 2025 Growth	17.9%	1.1%

Source: Compiled by Carla Walecka Planning, August 2001

Comparison of the Project To Plans and Policies. The proposed project's build-out total of 12,350 units does not reflect a net increase in the total number of housing units assumed in the City of Irvine's General Plan:

- 263 units already recognized in the General Plan for Planning Area 6 are included in the proposed project.

- 3,888 NCCP Housing Bank units included in the General Plan are allocated to the proposed project.

- 8,199 units that were approved but not built in other planning areas are being transferred to the project area under the residential transfer provisions of the General Plan.

Thus, the dwelling units and the population associated with them are being redistributed to the proposed project area from other planning areas or protected areas according to provisions in the General Plan. The transfer of units is summarized in Table 4-65.

Table 4-65
Redistribution of General Plan Housing Units to Proposed Project

Existing		Proposed	
Location	**Units**	**Location**	**Units**
NCCP Bank	3,888		
Planning Area 2	1,220		
Planning Area 5A	955	Planning Area 5B	1,900
Planning Area 6	263	Planning Area 6	4,500
Planning Area 8	804	Planning Area 8A	400
Planning Area 11	1,825	Planning Area 9	5,550
Planning Area 12	858		
Planning Area 15	2,537		
Total	**12,350**	**Total**	**12,350**

In addition to fitting within the City's General Plan housing allowances, the housing units included in the proposed project assist the City of Irvine in meeting state-mandated fair share housing production targets. The housing component of the proposed project implements the intent of the New Construction Policy C-1 (e), which speaks to the City's goal of developing housing opportunities to satisfy the RHNA targets. The units included in the proposed project may not be available within the time frame of the current RHNA targets. However, the RHNA targets and Housing Element are scheduled to be updated for 2005, and every five years thereafter. The 12,350 new units included in the proposed project will be needed to meet the City's future RHNA goals.

To help meet RHNA targets, the City's General Plan Housing Element sets specific Affordable Housing Needs Goals for new construction. The proposed project will meet the Affordable Housing Needs Goal by providing 5% of units for Income I and II households, 5% of units for Income III households, and 5% of units for Income IV households. The Affordable Housing Needs Goal will

be met through a combination of on-site construction and off-site affordable housing credits. Achievement of the Affordable Housing Goal is contingent upon the availability of financial incentives that reduce the difference between the actual cost of constructing a market rate housing unit and an affordable unit. The City will provide available financial assistance to help achieve the Affordable Housing Needs Goal for each Planning Area.

The City's General Plan Housing Element also addresses the City's current imbalance between job and housing opportunities. Against the backdrop of GPA 16, which projected a citywide jobs/housing balance of 3.66 at build-out of the General Plan, the 2000-2005 Housing Element examines ways to improve housing production and the balance between the housing supply and job base. New Construction Policy C-1 (e) and Balanced Employment/Residential Growth Objective C-8 call for:

- Adequate housing opportunities in each planning area to support growing job opportunities and to meet the City's RHNA requirement.
- A diversity of housing types and affordability to address housing needs generated by new development in the city.
- Matching housing types and prices to housing need generated by employment.
- A range of housing opportunities to allow Irvine residents to work within the City.
- Incentives for commercial/residential and live/work space projects.

From a regional perspective, Orange County and the City of Irvine have exhibited similar historic growth trends, with both County and City housing growth lagging population and employment growth. However, OCP-2000 projects that Irvine will outpace the County's housing and employment growth over the next 25 years. Irvine's housing growth rate is expected to be double that of the County as a whole over the next 25 years. Although employment will continue to grow as Orange County captures a steady portion of the region's growth due to its business and educational resources, and coastal location, Irvine's job growth rate will be 25% greater than the County's.

Within this broad context, the proposed project will provide 12,350 new housing units within one of the state's largest employment concentrations, including Irvine Business Center, Spectrum, and UC Irvine. The close proximity between these housing units and employment opportunities responds directly to the City's jobs/housing balance policies. The proposed project units will amplify the positive effects of proposed plans to locate 2,500 housing units within Spectrum.

In addition to fulfilling the Irvine General Plan and addressing state fair share housing requirements, the proposed project also responds to SCAG's regional job and housing growth policies in several ways:

The proposed project increases the number of houses in a jobs-rich City and subregion, as addressed in policy 3.11. SCAG uses the jobs/housing ratio to assess the relationship between housing and employment growth. The jobs/housing ratio is a general measure of the "balance" between the number of jobs and number of housing units within a geographic area, without regard to economic constraints or individual preferences. SCAG applies the jobs/housing ratio at the regional and subregional level as a tool for analyzing the fit between jobs, housing and infrastructure.

Table 4-66 compares the jobs/housing ratio for the proposed project with the current and projected jobs/housing ratios for the City, County and six-county Southern California region. Orange County and the City of Irvine are jobs-rich. In 2000, Irvine was home to 3.29 jobs for every dwelling unit in the City, while the County provided 1.54 jobs per household. Over time, both the County of Orange and the City of Irvine are expected to become more jobs-rich than today as a result of economic and demographic forces.

Table 4-66
Summary of Regional and Local Jobs/Housing Ratios, 2000 and 2025

	Proposed Project	City*	RSA E-44	County*
2000 J/H Ratio		3.29(1)	2.78	1.54
2025 J/H Ratio	1.44	3.79	3.87	1.83

Source: Carla Walecka Planning
** Based on OCP-2000 and SCAG 2001 Regional Transportation Plan projections.*
(1) The City of Irvine's Housing Element, November 2000, estimated the current jobs/housing ratio to be 3.4 jobs per housing unit.

The City of Irvine is split between RSA E-44 and RSA F-39 along the San Diego (I-405) Freeway alignment. In addition to the City of Irvine, RSA E-44 also contains portions of Orange, Santa Ana, Tustin and Costa Mesa. The proposed project lies in the center of RSA E-44. The proposed project represents 21% of RSA E-44 job growth forecasted by OCP-2000 for the 2000-2025 period. The jobs/housing ratio for RSA E-44 is 2.78 in 2000, and 3.87 in 2025. These ratios reflect the fact that RSA E-44 also contains Irvine Spectrum, one of the region's and the State's major economic activity centers. SCAG policies encourage development in activity centers and areas served by transportation corridors, such as RSA E-44.

The proposed project will provide 12,350 housing units to balance the addition of jobs to an existing regional employment concentration, as well as to balance continued strong job growth planned for the City. By achieving a 1.44 jobs/housing ratio, the proposed project benefits the overall City and subregional jobs/housing balance. Table 4-66, shown above, compares the proposed project's jobs/housing ratio with Irvine, RSA, County and Region jobs/housing ratios for both 2000 and 2025.

The proposed project locates job and housing growth near activity centers and transportation corridors, and organizes that growth in mixed use clusters: In accordance with SCAG policies 3.15 and 3.16, the project concentrates employment and housing growth in an activity area near transportation corridors. Further, the proposed project mixes this housing and job growth in a manner conducive to walking, biking and transit alternatives to automobile travel. The project would interface with commercial, residential and mixed-use areas including the existing Irvine Spectrum activity center and future development within Planning Area 51. The proposed project is adjacent to High Occupancy Vehicle lanes on the Santa Ana (I-5) Freeway , and the Foothill and Eastern Transportation Corridors (SR-241 and SR-73, respectively) (which are priced to insure free flow).

As SCAG's policies intend, the proposed project's growth pattern provides an employment concentration that makes public transit, paratransit, carpooling, vanpooling, and other Transportation Demand Management programs which significantly reduce Vehicle Miles Traveled, congestion, and associated emissions more viable. The close proximity between jobs and housing would also enable walking and biking as pollution-free alternatives to driving, thus providing a further opportunity for reducing trips, Vehicle Miles Traveled, congestion and emissions.

The adjacent Irvine Spectrum employment center illustrates the benefits of concentrating employment growth in a manner similar to the proposed project. Spectrumotion is a comprehensive and fully operational Transportation Demand Management Program designed to reduce trips and vehicle miles traveled by employees within Spectrum. Participation in Spectrumotion is mandatory for all property owners within Spectrum. Documentation presented to Institute of Transportation Engineers finds that the proportion of drive-alone commute trips within Spectrum is well below comparable rates in Los Angeles and Orange Counties. This in turn results in less congestion and lower emissions. (J. Boslet and S. McCaughey, Irvine Spectrum Trip Reduction Program, 2000).

The proposed project addresses the need to better match housing to job opportunities, as articulated by SCAG policy 3.04. Workforce housing is a concept that attempts to match the amount and type of housing with the amount and type of employment available within a jurisdiction. A community with a highly educated technical job base requires a greater proportion of moderate and upper income housing to encourage residents to work locally and reduce their travel and the environmental impacts associated with long commutes.

The proposed project would provide a variety of apartment, condominium and single family housing opportunities within the project area. These housing types are responsive to the types of workers that will be employed in the project area, as well as in adjacent Spectrum and Planning Area 51 projects.
Summary of Housing Impacts:

- The proposed project exceeds OCP-2000 2025 housing projections for its geographic area.

- The proposed project provides housing that is allowed for and anticipated by the Irvine General Plan. The proposed project housing will assist in meeting Regional Housing Need Goals set by the General Plan

- The proposed project provides new housing that helps meet regional goals for jobs/housing balance. In addition, the project responds to regional policies that favor development near activity and employment centers and near transportation and transit nodes.

- The proposed project will help to meet the state's post-2005 fair share housing targets that encourage increased production of affordable housing.

Population Growth Impacts

The proposed project's population growth is a direct consequence of its housing component. The City of Irvine has established factors that represent the typical number of residents per unit of single family and multi-family housing. Based on the City's factors, 12,350 dwelling units are expected to generate a resident population of 34,833 in the project area by 2025.

Comparison of the Project to OCP-2000: OCP-2000's growth distribution to the zones that comprise the proposed project accounts for 18,173 (52%) of the total 34,833 population that would occupy the 12,350 dwelling units constructed in the project area by 2025. 48% of the population that would occupy the housing units is not anticipated in OCP-2000 for this property.

Comparison of the Project to Plans and Policies: Although the proposed project's population exceeds OCP-2000 small zone projections, the population is consistent with the amount of housing allowed under the City's General Plan. As noted in the discussion of housing impacts, the proposed project includes 263 units assigned in the General Plan to Planning Area 6, transfers 8,199 units included in the General Plan to the project area from other planning areas, and draws on 3,888 units from the NCCP Housing Bank within the General Plan.

The proposed project's population is also consistent with City and regional goals to provide additional housing opportunities to balance jobs within a major regional employment concentration.

Finally, the proposed project's population is consistent with the State's and City's commitment to provide more housing to meet housing demand and fair share housing targets. These targets are intended to motivate consistent progress toward meeting the housing needs of Orange County residents. The proposed project's housing will accommodate a portion of the County's projected 562,280 (20%) population increase between 2000 and 2025. Eighty-five percent of this population increase will be due to births within the County (The Orange County Planner, August/September 2001).

Summary of Population Impacts:

- The proposed project's 2025 population exceeds OCP-2000 projections for the project's geographic area.

- The proposed project's population is consistent with the amount of housing accommodated by the City of Irvine General Plan.

- The proposed project's population is consistent with increased housing production to meet city, regional and state goals for more affordable housing, as well as city and regional goals for increased balance between housing and job opportunities.

Summary of Significant Project Impacts

Threshold of Significance: Inducement of Substantial Direct or Indirect Growth In the Area.

- ***Significant, But Not Adverse, Employment Growth Impact:*** The proposed project would result in employment growth that is 26% less than the level expected in OCP-2000 small area growth projections for the project area. The proposed project concentrates and clusters the employment growth in accordance with regional policies. The proposed project exceeds the amount of employment-generating development provided for the project area in the current General Plan. However, by intensifying the level of employment included in the General Plan, the proposed project responds to regional policies aimed at reducing overall travel and air pollutants by concentrating employment near transportation facilities to increase ride-sharing, transit and alternative forms of transportation. The proposed project employment also helps balance housing-rich south Orange County by providing nearby jobs, consistent with SCAG jobs/housing balance policies.

  Taking these factors together, the proposed project results in an employment growth impact. This impact is considered to be significant but not adverse in light of the project's job intensification benefits that address SCAG regional job location and jobs/housing balance policies.

- ***Significant, But Not Adverse, Housing Impact:*** The proposed amount of housing growth is consistent with and accommodated by the City's adopted General Plan. The proposed project contains 263 housing units already allocated to Planning Area 6 under the General Plan; 3,888 units drawn from the General Plan's NCCP Housing Bank; and 8,199 units transferred from other planning areas under the General Plan's residential transfer provisions. In addition, the proposed project contributes to meeting state-mandated Regional Housing Needs Assessment housing production targets beyond 2005. The proposed project supports the City Housing Element Affordable Housing Need Goals for new construction. Further, the proposed project implements City and regional policies encouraging increased production of housing in job-rich areas. The proposed project contributes to a more balanced jobs/housing ratio consistent with both regional and city General Plan policies. However,

the proposed project would result in housing growth that exceeds OCP-2000 growth projections for the project area.

Taking these factors together, the proposed project results in a significant, but not adverse, impact on housing. By providing housing units in excess of OCP-2000, the proposed project would help implement the City's adopted General Plan and benefit the local and regional need for increased housing production, more affordable housing, more housing that is located in proximity to jobs, and greater balance between the amount of housing and job opportunities. In view of its implementation of the City's General Plan and its positive impact on achieving local and regional policies on housing and jobs/housing balance, this significant impact is considered to be positive rather than adverse.

- ***Significant, But Not Adverse, Population Impact:*** The proposed project would result in population growth that is a direct consequence of its housing growth. The proposed project's population growth is consistent with total housing units allowable under the Irvine General Plan. Further, the proposed project would concentrate resident population within an area of abundant job opportunities, thus addressing local and regional policies aimed at matching housing and job opportunities, and reducing trips and emissions. The proposed project's population is also consistent with the City General Plan's ongoing effort to boost housing production to meet its fair share of regional housing needs, as required by state law. However, the proposed project's population growth exceeds OCP-2000's small zone projections for the project area.

  Taking these factors together, the proposed project results in significant population impacts. In view of the project population's positive relationship to state, regional and local housing and jobs/housing balance goals, these impacts are considered to be significant but not adverse impacts.

Threshold of Significance: Displacement of Substantial Numbers of Housing Units.

- ***No Housing Displacement Impact***. The proposed project does not displace housing units, or necessitate the construction of replacement housing elsewhere. Therefore, no impact would result.

Threshold of Significance: Displacement of Substantial Numbers of People.

- ***No Population Displacement Impact.*** The proposed project will not displace substantial numbers of people. Therefore, no impact would result.

Cumulative Impacts

The purpose of this section is to evaluate the incremental impact that the proposed project is likely to cause in relation to any existing cumulative impact due to already approved projects. In the interest of full disclosure, this section also includes a sensitivity analysis that discusses the potential impacts of other probable future projects within the City and its sphere.

This analysis of cumulative impacts examines the proposed project in three different contexts:

- *General Plan Buildout with Millennium Plan II*: This scenario consists of the proposed project in combination with other recently approved projects contained in the Irvine General Plan, including Spectrum 8, Planning Area 17, Planning Area 27, and the Millennium II plan for redevelopment of the MCAS El Toro site.

- *General Plan Buildout with OCX (El Toro Aviation Plan):* This scenario examines the combined impact of the proposed project together with Spectrum 8, Planning Area 17, and Planning Area 27, with substitution of the County of Orange's adopted plan for redevelopment of MCAS El Toro as Orange County International Airport in lieu of Millennium II.

- *Sensitivity Analysis of "Probable Future" Projects*: As an adjunct to the cumulative impact scenario, the sensitivity analysis evaluates the additional potential contribution to cumulative impact from probable future projects. The proposed Great Park project for substitutes for Millennium II in this analysis.

Thresholds for Determining Cumulative Impacts

Section 15130(a) of the state's CEQA Guidelines requires a discussion of cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." Further, Section 15355 of the Guidelines defines a cumulative impact as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Cumulatively considerable impacts are defined in Section 15065(c): "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

Methodology

The growth impact of the proposed project will be examined in light of projects recently approved within the proposed project vicinity. The cumulative impact analysis will examine the extent to which the proposed project contributes to a cumulative impact in conjunction with these projects. Section 3.11 includes additional background information on the cumulative impact analysis.

The determination of cumulative impacts is based on two criteria considered in combination:

OCP-2000 projections for population, housing and employment will be used as one benchmark for evaluating the cumulative population, housing and employment contribution of the proposed project. OCP-2000 projects population, housing and employment growth by City and Regional Statistical Area within Orange County, which allows examination of incremental project impacts at both the City and subregional levels. OCP-2000 projections are based on city and county General Plans, and special district, public agency , service provider and private sector information. Previous Table 4-63 summarizes OCP-2000 projections for the City, County and Regional Statistical Area in which the proposed project is located :

City, Regional and State Plans and Policies will also serve as a yardstick for cumulative impacts. The proposed project in combination with other projects will be evaluated against the City of Irvine General Plan and relevant regional and state policies. These include the Southern California Association of Governments' Regional Comprehensive Plan and Guide, and the state fair share housing production mandate.

General Plan Buildout with Millennium Plan II

The following General Plan Amendments have recently been approved in the proposed project vicinity: Spectrum 8 (commercial/industrial); Planning Area 17 (housing) and Planning Area 27 (housing). In addition, the City has approved the Millennium II project for reuse of the MCAS El Toro property, consisting of commercial and housing development at the former air base site.

All of these recently approved projects are reflected in the City of Irvine General Plan. Therefore, the preceding discussion of the proposed project's population, housing and employment impacts in comparison to the General Plan encompasses the cumulative impact of the proposed project in combination with these approved projects, including the cumulative impact of the proposed project with Millennium II. To recap:

Cumulative Employment Impacts: While the City's General Plan has been amended to include employment associated with Spectrum 8, Planning Area 17, Planning Area 27, and Millennium II, the proposed project captures employment growth which is not provided for by the Irvine General Plan. This employment growth above General Plan levels results in a cumulative employment impact which is significant, even though it fits within OCP-2000 small area projections for the project site in 2025. However, this significant employment growth is not adverse in light of the project's regional policy benefits: the proposed project concentrates employment near activity centers as well as transportation and transit infrastructure, which in turn reduces travel, congestion and associated emissions. The proposed project's employment also balances the current and future housing-rich nature of south Orange County.

On balance, the proposed project in combination with approved projects, including Millennium II, results in a significant, but not adverse, cumulative employment impact.

Cumulative Housing Impacts: The Irvine General Plan includes housing growth associated with the proposed project as well as recently approved developments in Planning Area 17, Planning Area 27, and Millennium II. However, the proposed project together with the recently approved projects cumulatively exceed OCP-2000 projections for their respective project areas in 2025. The proposed project's housing responds to city, regional and state plans and policies which encourage more affordable housing, particularly in jobs-rich areas such as Irvine. Thus, the proposed project results in a cumulative housing impact which is significant but not adverse given its benefits in terms of city General Plan, as well as regional and state, housing policies.

Thus, the proposed project in combination with approved projects including Millennium II, results in a significant, but not adverse, cumulative housing impact.

Cumulative Population Impacts: The proposed project's resident population growth is consistent with the amount of housing growth anticipated by the General Plan, which includes population resulting from housing growth in Planning Area 17, Planning Area 27, and Millennium II. However, the population growth associated with these projects cumulatively exceeds OCP-2000 small area projection for their respective project areas in 2025.

On balance, the proposed project together with approved projects, including Millennium II, results in a significant, but not adverse, cumulative population impact.

Table 4-67 summarizes the cumulative impacts of the proposed project together with approved projects with Millennium II as described above.

Table 4-67 Summary of Cumulative Impacts			
	Potential Cumulative Employment Impact?	**Potential Cumulative Housing Impact?**	**Potential Cumulative Population Impact?**
General Plan Buildout with Millennium Plan II			
	Yes/Not Adverse	Yes/Not Adverse	Yes/Not Adverse
General Plan Buildout with OCX (El Toro Aviation Plan)			
	Yes/Not Adverse	Yes/Not Adverse	Yes/Not Adverse
"Probable Future" Projects			
	No	Yes/Not Adverse	Yes/Not Adverse

General Plan Buildout with OCX (El Toro Aviation Plan)

At the present time, the former MCAS El Toro site is contained in the City of Irvine's sphere of influence. The City of Irvine proposes to annex the El Toro site, as provided for by the Millennium II plan. In the meantime, the County of Orange has jurisdiction over the airport land use. The County designates the former MCAS El Toro site for airport uses in its General Plan, and a Final EIR for reuse of the El Toro site as a commercial airport was certified by the County Board of Supervisors on October 23, 2001.

The preceding discussion of significant growth impacts in comparison to OCP-2000 projections already accounts for the impacts of the proposed project in combination with the commercial airport alternative for MCAS El Toro. OCP-2000 reflects growth consistent with a commercial airport at El Toro operating at 28.8 million annual passengers by 2020. To recap:

Cumulative Employment Impact: Both the proposed project and the Orange County International Airport project fit within small area OCP-2000 projections for their respective areas. However, the cumulative total of new jobs associated with the proposed project, the airport, and other recently approved projects exceeds levels projected by OCP-2000 for their combined project areas in 2025. Employment-generating commercial, office and industrial uses are not currently indicated in the Northern Sphere Area in the current Irvine General Plan. Cumulative employment growth results in benefits in terms of City and regional policies that promote jobs/housing balance, and regional policies that promote employment concentrations, especially near transportation and transit corridors.

Thus, the proposed project in combination with approved projects, including a commercial airport at El Toro, results in a significant, but not adverse, cumulative employment impact.
Cumulative Housing Impact: The Orange County International Airport project does not include any

housing, while other recently approved projects would add 4,530 new housing units. The proposed project includes new housing units beyond the level indicated in OCP-2000. However, the project's housing growth is consistent with the City's General Plan housing allowances; with regional policies that favor housing production in jobs-rich areas and areas served by major transportation corridors and transit; and with local, regional and state policies encouraging production of affordable housing.

On balance, the proposed project in combination with approved projects, including a commercial airport at El Toro, results in a significant, but not adverse, cumulative housing impact.

Cumulative Population Impact: Orange County International Airport does not include any resident population. However, the proposed project as well as other recently approved projects would result in a resident population that exceeds levels projected by OCP-2000 for their respective project areas in 2025. Nevertheless, this population increase is an unavoidable consequence of increased housing production to meet city, regional and state policies that call for more affordable housing, more housing in job-rich areas. Further, this population increase is consistent with the residents that would occupy the amount of housing provided for in the City General Plan.

Taken together, the proposed project in combination with approved projects, including a commercial airport at El Toro, results in a significant, but not adverse, cumulative population impact. Previous Table 4-67 summarizes the cumulative impacts of the proposed project in combination with adopted plans for Orange County International Airport.

"Probable Future" Projects

A number of other probable future projects, in various stages of discussion and environmental documentation, have been identified as of the time that this DEIR is being prepared. Although these projects are not approved, and some of them may not be fully pursued, this section provides a sensitivity analysis that describes their potential additional impact on population, housing and employment beyond the cumulative effects of the proposed project in combination with approved projects.

The following probable future projects are included in this sensitivity analysis:

- *Great Park:* The City of Irvine has announced a third proposal for the MCAS El Toro site and is in the process of preparing an EIR. It would result in annexation of the El Toro site to the City, which is currently outside the City's jurisdiction. At present, the Great Park concept consists of 200 housing units, and retail and office uses that would generate 12,244 jobs. The specific amount of development is still being refined by the City of Irvine. If eventually approved, the Great Park proposal would replace the City's Millennium II Plan. (G. Worthington, City of Irvine).

This sensitivity analysis assumes that the Great Park proposal replaces either the City of Irvine's approved Millenniu m II plan or the County of Orange's approved commercial airport plan for the former MCAS El Toro property.

- *Spectrum Housing:* A Final EIR is being prepared by the City of Irvine for the addition of 2,500 housing units in the Spectrum office/industrial complex. (General Plan Amendment 41359 and Zone Change 41360, City of Irvine).

- *Lower Peters Canyon:* The Irvine Company has proposed a reduction of 490 housing units in the previously approved Lower Peters Canyon Project in exchange for commercial development that would generate an estimated 1,470 jobs within the same project. This project is in the discussion stage.

- *Woodbridge General Plan Amendment Zone Change:* A Negative Declaration has been prepared to add 85,000 square feet of mini-warehouse uses to the Woodbridge area. The Negative Declaration determined that no residential uses are involved and that employment impacts are de minimus (M. Philbrick, City of Irvine).

- *Open Space Dedication.* The Irvine Company intends to expand permanent open space on the Irvine Ranch in the East Orange and North Ranch Policy Planning Area. This intent would ultimately be implemented through conservation easements. When finalized, this expansion of permanent open space would prohibit development in these areas, which have previously been slated for residential and commercial development during the 2000 to 2025 time period. Thus, the open space expansion would result in a population, housing and employment reduction that impacts the City of Irvine, RSA E-44 and the County as a whole.

  A portion of the East Orange planning area south of Santiago Canyon Road falls within RSA E-44. The sensitivity analysis of the potential future increment of growth captured by probable future projects will focus on the impact of this portion of the open space expansion. This portion of the expanded open space would result in no jobs, housing units or population within this part of RSA E-44, which OCP-2000 projects would otherwise include 7,714 jobs, 1,048 housing units , and 2,551 residents in 2025.

Since these potential projects are not yet approved, the amount of population, housing and employment associated with them may change. The sensitivity analysis is based on information available at the time this DEIR was prepared.

Potential Additional Employment Impacts: Two of the five probable future projects would result in employment growth. The Great Park project and Lower Peters Canyon intensity transfer would capture 13,714 jobs by 2025.

Comparison with OCP-2000: Approved projects in combination with the proposed project add 10,165 jobs more than OCP-2000 projects for their respective project areas in 2025. Probable future projects would result in 22,931 jobs less than predicted for the project areas in 2025. Cumulatively, this scenario results in a total of 12,766 jobs below OCP-2000 projections for 2025.

Comparison with City, Regional and State Plans and Policies: Probable future projects would reduce job growth to levels well below those projected by OCP-2000. Together with approved projects and the proposed project, probable future projects would improve jobs/housing balance within the RSA by decreasing anticipated job growth in a jobs-rich subregion, consistent with City General Plan and SCAG regional policies promoting jobs/housing balance.

On balance, probable future projects would not result in a cumulative employment impact.

Taking these factors together, probable future projects would not result in a potential additional cumulative employment impact.

Potential Additional Housing Impacts: Taken together, probable future projects would result in 2,210 new housing units by 2025.

Comparison with OCP-2000: Probable future projects would result in 907 housing units above projected OCP-2000 levels for the respective project areas for 2025. This would increase the cumulative impact of prior approved projects together with the proposed project above OCP-2000 levels for their respective project areas in 2025.

Comparison with City, Regional and State Plans and Policies: The housing growth resulting from probable future projects would respond to City General Plan policies that call for increased housing production to meet housing demand generated by job opportunities within the city, as well as state housing production mandates. Probable future project housing growth also addresses SCAG regional policies that encourage more housing in job-rich areas such as RSA E-44 to improve jobs/housing balance, congestion and emissions.

Taking these factors into account, probable future projects would result in a significant potential cumulative housing impact. This potential cumulative impact is not considered to be adverse due the projects' benefits for housing production and jobs/housing balance consistent with the City General Plan, and state and regional policies.

Potential Additional Population Impacts: Probable future projects would result in 4,270 new residents by 2025.

Comparison to OCP-2000: Approved projects plus the proposed project result in 16,660 residents above OCP-2000 projections for their project areas in 2025. Probable future projects would decrease

population by 3,749 residents from OCP-2000 projections for the project areas within the project vicinity. This results in a potential cumulative increase of 12,911 residents above OCP-2000 projections for the combined approved, proposed, and probable future project areas in the project vicinity.

Comparison to City, Regional and State Plans and Policies: The population increase due to probable future projects is consistent with the amount of housing included in the projects. In turn, the housing growth is consistent with the City's General Plan as well as SCAG's regional policies that encourage more housing in job-rich areas to improve jobs/housing balance, congestion and emissions. Thus, the project population that results from these units also supports these regional policies.

Taking these factors together, probable future projects would reduce the existing cumulative population impact associated with prior approved projects in combination with the proposed project, but a significant cumulative impact would remain. This cumulative population impact is considered to be significant, but not adverse, because the population growth associated with the potential projects is a necessary consequence of providing housing per regional jobs/housing balance and housing production policies.

4.11.3 MITIGATION MEASURES

Existing Regulations and Standard Conditions

The City of Irvine has no standard conditions of approval related to population and housing which apply to the proposed development of the Northern Sphere Area.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to population and housing impacts have been proposed.

Additional Mitigation Measures

No additional mitigation measures are proposed.

4.11.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The job growth resulting from the proposed but not yet approved projects would help balance the housing-rich areas in south Orange County RSAs C-43 and D-40. Further, the job growth represents an intensification near existing transportation and transit facilities that encourages transportation demand management programs that, in turn, reduce overall travel, congestion and emissions. This support SCAG regional policies that call for concentrated employment centers and regional jobs/housing balance.

The potential future projects as a group would exceed OCP-2000 housing projections for their project areas within the City and sphere. However, this housing growth would address City General Plan policies calling for increased housing production to meet housing demand generated by job opportunities within the city, as well as state housing production mandates. The proposed but not approved projects would also address SCAG regional policies that encourage more housing in job-rich areas to improve jobs/housing balance, congestion and emissions.

While the potential future projects as a group would exceed OCP-2000 population projections, the additional population is consistent with the amount of housing in the projects that would address City General Plan policies for increased housing production to meet housing demand generated by job opportunities within the city, as well as state housing production mandates. Further, the proposed but not yet approved project's population is consistent with housing growth that supports regional policies that encourage more housing in job-rich areas to improve jobs/housing balance, congestion and emissions.

Taking all of these factors into consideration, the proposed project along with other cumulative development in the area would result in a potential cumulative impact on employment, housing, and population. However, this potential impact is considered to be significant but not adverse in light of the employment's contribution to improved jobs/housing balance and transportation demand management promoted by SCAG's regional policies.

4.12 Public Services

4.12.1 FIRE PROTECTION

Environmental Setting

The Orange County Fire Authority (OCFA) provides fire protection and paramedic services to the City of Irvine, and 19 other jurisdictions. Stations that would respond to emergencies at the proposed project site and a summary of their current equipment and staffing levels are listed in Table 4-68 below.

Table 4-68
Responding Fire Stations

Station No.	Location	Apparatus	Staffing (per shift, 3 shifts)	Estimated Distance to the Northern Sphere Area (miles)
20	Former El Toro MCAS (temporary site/closing)	- Engine	3 - Personnel	1
38	26 Parker, Irvine (proposed for relocation to Irvine Boulevard and Magazine Road)	- Paramedic Van - Engine	5 - Firefighters	3
26	4691 Walnut Ave., Irvine	- Paramedic Van - Engine	5 - Firefighters	2
55	Proposed station in Northwood.	N/A	N/A	N/A
20	Proposed station in Planning Area 40/Spectrum July 2001.	N/A	N/A	N/A

Emergency services provided by the OCFA include fire suppression, emergency medical response, hazardous materials response, and rescue services. In addition, OCFA provides a wide variety of other services such as public education, disaster planning and coordination, fire prevention inspections, building plan review, hazardous materials disclosure program management, fire investigation, emergency dispatching and communications, media relations, legislative analysis, facility management and fleet maintenance. OCFA maintains mutual aid agreements with the Cities of Newport Beach, Costa Mesa, and Laguna Beach, and the State of California.

Currently, the response time to the project site for the first responding unit ranges from 7 to 12 minutes. The OCFA standard for response time is for the first engine to reach the emergency scene within five minutes for 80% of emergency calls and a paramedic to reach the scene within eight minutes 90% of the time of dispatch.

OCFA contracts with Doctors Ambulance, dispatched from the Irvine Ambulance Service Area, to provide emergency medical treatment and transportation for the City of Irvine. Pursuant to this contract, Doctors Ambulance is required to respond within ten minutes for emergency code 3 (known life threatening situations) not less than 90% of the time, and within 15 minutes for urgent code 2 (non-life threatening situations) not less than 90% of the time. The ambulance service maintains mutual aid agreements with neighboring ambulance companies and subcontracts areas that are beyond its 15 minute radius to other companies.

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on fire protection services if it results in the following:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection services.

Project Impacts

The proposed residential uses are expected to create the typical range of fire service calls that other such uses create, including structure fires, garbage bin fires, car fires, electrical fires, etc. The project buildout of 12,350 homes would increase demand for fire service resources. New fire facilities and apparatus will need to be constructed in order to provide adequate response times to the Northern Sphere Area. There would also be an increase in the number of responses to this area which would increase the demand for existing apparatus, equipment and personnel. Therefore, OCFA costs to maintain equipment and apparatus and to train and equip personnel would also increase.

The new designation of Medical and Science, as a result of the proposed project, means there is potential for hazardous materials to be used on the site. Hazards and hazardous materials are discussed in Section 4.7 of this Program EIR. The OCFA has developed requirements for businesses which use, store, or handle hazardous materials to disclose those materials to OCFA, the local administering agency. Businesses are required to disclose all hazardous materials and wastes above

certain designated quantities which are used, stored, or handled at their facility. Businesses must also prepare safety and hazard mitigation plans, review the plans regularly, and perform training at least annually (OCFA, 2000).

According to the OCFA, the proposed project would not increase the potential for wildland fires in adjacent or natural areas if OCFA guidelines and requirements are followed.[29] Due to the increased demand on fire services, the OCFA will require the developer to enter into a secured fire protection agreement with the OCFA to insure that the project will provide adequate fire protection and equipment to serve the project within the standard estimated response time.

As indicated by OCFA, existing fire stations are not adequate to provide emergency services within OCFA response time goals. However, the Master Plan of Fire Stations has designated two new Fire Stations No. 55 and No. 20 to be constructed within close proximity to the project prior to development. In addition, the proposed project will require development of a new fire station or the relocation of existing stations in order for the OCFA to provide adequate service to the other 19 cities and unincorporated Orange County areas under OCFA jurisdiction. No significant impacts to fire services are anticipated to result from this project. Construction and operation impacts for the needed new fire stations are not exceptional to the impacts of the project generally, and are not considered significant individually or cumulatively.

Compliance with fire protection design standards during the precise site planning and construction design processes, as described under "Existing Regulations and Standard Conditions as Mitigation," will help ensure that future development within the Northern Sphere Area does not inhibit the ability of fire protection or paramedic crews to respond at optimum levels.

Cumulative Impacts

Implementation of this project in combination with other projects in the vicinity, in accordance with the adopted General Plan will result in increased engine company workload. This workload includes station and equipment maintenance, training, fire prevention inspection, as well as emergency responses. The additional personnel and materials costs will be offset through the increased revenue generated by cumulative development. In addition, cumulative projects are reviewed by the OCFA on an individual basis and are required to negotiate appropriate mitigation (i.e., fire station sites, impact fees, etc.) when OCFA determines the impacts to be significant. Therefore, cumulative impacts on fire and emergency medical services are not considered significant.

Mitigation Measures

Existing Regulations and Standard Conditions

[29] *Correspondence with Michael Rohde, Advanced Planning, Orange County Fire Authority, letter dated June 11, 2001.*

12.1 The landowner or subsequent project applicant shall comply with all applicable OCFA codes, ordinances, and standard conditions regarding fire prevention and suppression measures, relating to water improvement plans, fire hydrants, automatic fire extinguishing systems, fire access, access gates, combustible construction, water availability, fire sprinkler system, etc.

12.2 Prior to the release of a final map by the City, all fire protection access easements shall be approved by the Orange County Fire Authority and irrevocably dedicated in perpetuity to the City. (Standard Condition 1.10.)

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to fire service impacts have been proposed.

Additional Mitigation Measures

12.3 Prior to the release of the first final map (except for financing and conveyance purposes) for each Planning Area by the City, the landowner or subsequent project applicant shall submit evidence of a secured fire protection agreement with the OCFA to mitigate adverse impacts of the project on the OCFA. Such an agreement may include participation on a pro-rata basis in funding capital improvements necessary to establish adequate fire protection facilities, apparatus and equipment to serve the project.

Level of Significance after Mitigation

No significant project-level impacts to fire protection services have been identified. Implementation of the mitigation measures listed above will assist OCFA in meeting cumulative growth-driven demands for fire protection services and would offset any significant cumulative impacts related to this project.

4.12.2 POLICE PROTECTION

Environmental Setting

The project site is served by the Irvine Police Department located in central Irvine at One Civic Center Plaza, on the corner of Harvard Avenue and Alton Parkway, approximately five miles from the project's nearest border along Planning Area 8A. The Irvine Police Department provides all services normally associated with public safety including patrols, investigations, crime analysis, crime prevention, K-9 unit, Special Operations Unit (SWAT), forensic investigations, accident investigations/traffic enforcement, Drug Abuse Resistance Education (DARE), and emergency management/disaster preparedness. The department also has emergency access to helicopter services, and mutual aid assistance from surrounding city, county, State, and federal agencies.

The Irvine Police Department operates under a full service Community Oriented Policing philosophy. The Department has access to contract helicopter service through the Costa Mesa Police Department. Mutual aid assistance agreements exist providing support from other Orange County law enforcement jurisdictions, state and federal agencies. An immediate mutual aid response to the project site could be expected from the Orange County Sheriff's Department, Tustin Police Department and Laguna Beach Police Department. Response guidelines for police calls are as follows:

- Priority E (Emergency) calls within six minutes 85% of the time.
- Priority 911 (Incomplete or hang up) calls within ten minutes 85% of the time.
- Priority I (Crimes in Progress) events within 10 minutes 85% of the time.
- Priority II (Less Serious Crimes Occurring Now) events within 20 minutes 90% of the time.
- Priority III (Routine calls for service) within sixty minutes, 85% of the time.

Currently the Irvine Police Department is meeting these response time goals. The number of officers available to respond to calls is dependent on several factors including the type of incident/crime, distribution of manpower, level of activity, and time of day. At any given time, a minimum of nine and a maximum of 23 sworn officers are available to respond to calls for service anywhere in the City. Beat assignments are based on projected calls for service. According to the Irvine General Plan "typical planning areas with a population of 10,000 to 20,000 require 1.5 officers per 1,000 persons and a facility size of 5.1 acres. The current ratio of sworn officers to population in the City of Irvine is approximately 1.13 per 1000.[30]

The Irvine Police Department enforces the City's traffic laws on the local street system. Traffic enforcement on area freeways and in the unincorporated Orange County area is provided by the California Highway Patrol and the Orange County Sheriff's Department.

[30] *Correspondence with Lierre M. Green, Advanced Physical Planning, Irvine Police Department, letter dated, June 25, 2001.*

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on police protection services if it results in the following:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection services.

Project Impacts

During construction the proposed project is expected to generate an increase in emergency and routine calls to the Irvine Police Department. Anticipated crime and safety issues during project construction include theft of building materials and construction equipment, malicious mischief, graffiti and general vandalism.

After construction, the proposed project is expected to create the typical range of police service calls that other such uses create, including vehicle burglaries, residential burglaries, thefts, etc. The Irvine Police Department utilizes the number of dwelling units, anticipated population, amenities, and projected crimes to determine the number of patrol units needed to service new development. The Irvine Police Department anticipates that this project will require a total of 48 sworn officers to service the project area, as shown in Table 4-69. In addition, there should be one supervisor per 10 officers, one support employee per 10 officers, and 4.5 sworn officers to staff one patrol unit 24 hours per day, 365 days per year.

Due to the significant population to be served and the distance from the main police facility, a substation should be considered. This substation should be able to accommodate at least 25 personnel and any specialized equipment needed to service this area. The facility could be part of a small complex which accommodates other City departments' needs to service this area. Response time goals may not be met depending upon: (1) phasing of developments and distance from existing developed areas, and (2) timely employment of additional personnel to keep up with the population and/or non-residential developments. Construction and operation impacts for a new substation are not exceptional to the impacts of the project generally, and are not considered individually or cumulatively.

Table 4-69 Police Staffing Needs by Use			
Use	**Formula**	**Square Footage/ Dwelling Units**	**Total Officers needed**
Medium Density Residential	DU's x 2.6 x 1.5 officer per 1,000 residents	10,550 DUs	41.1
Medium-High Density Residential	DU's x 2.13 x 1.5 officer per 1,000 residents	1,800 DUs	5.8
Retail	1 sq. ft. x 5.49 seconds divided by 4,600 divided by 2,080.	750,000 sq. ft.	0.4
Research and Development	1 sq. ft. x .757 seconds divided by 4,600 divided by 2,080.	6,566,000 sq. ft.	0.5
Total			**47.8**

Cumulative Impacts

Although no significant impacts to police protection services are anticipated as a result of this project, the increased demand for these services would contribute to a potentially significant cumulative impact due to projected levels of growth throughout Irvine. The Orange County Council of Government projects an estimated increase in the City's total population of 48,034 persons and an increase in city-wide employment of nearly 75,954 jobs by the year 2020, based on OCP-2000 projections (refer to Section 4.11 for a detailed discussion on population and employment projections). A substantial increase in residential, commercial and industrial development would need to occur to accommodate this projected growth. Based on a desired ratio of 1.5 sworn officers per 1,000 residents, this would represent a need for approximately 72 additional officers by the year 2020. Based on the existing ratio of 1.13 sworn officers per 1,000 residents, the estimated population increase would require approximately 54 officers by the year 2020, or three officers per year. To the extent that police department resources are expanded in an efficient manner in accordance with growth trends, no significant cumulative impacts related to police protection services are anticipated. Through the City's Strategic Business Plan and annual budget review process, police department needs are assessed and budget allocations are revised accordingly to ensure that adequate levels of service are maintained throughout the city. For example, in recent years, four new sworn officers have been added on an annual basis, with additional support staff resources provided through reallocation of duties of existing staff. Given this ongoing process, no significant cumulative impacts to police protection services are anticipated.

Mitigation Measures

Existing Regulations and Standard Conditions

12.4 Tentative tract map and master plan applications shall be prepared in accordance with the Uniform Security Code, specifically the site planning guidelines referred to as Crime Prevention Through Environmental Design (CPTED). These guidelines are intended to optimize the ability of the Police Department to respond quickly and effectively to calls for assistance and also to incorporate crime prevention measures into the design of future homes. Examples of such measures include minimizing vegetation or structural screening that could obstruct visibility into private homes or yards by passing patrol units, and installation of special locks and/or electronic security devices.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to police service impacts have been proposed.

Additional Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

No significant project-related impacts have been identified. To the extent that police department resources are expanded in an efficient manner in accordance with growth trends, no significant cumulative impacts related to police protection services are anticipated.

4.12.3 PUBLIC SCHOOLS

Environmental Setting

The project site is located within the boundaries of the Irvine Unified School District (IUSD). The IUSD currently operates 23 elementary, seven (7) middle, and five (5) high schools within the City of Irvine. The 2000 district-wide enrollment was 24,254 students with a gross student capacity of 30,995 students, leaving a capacity for approximately 6,741 additional students.[31] IUSD presently owns a site located at the northern corner of Planning Area 5B. The elementary, middle, and high school campuses that are located closest to the site include Northwood Elementary School (grades K-6) located on Carson, Sierra Vista Middle School (grades 7-8) located on Liberty, Irvine High School (grades 9-12) located on Walnut Avenue and Northwood High School (grades 9-12) located on Portola Parkway. The enrollment versus capacity for these schools are shown in Table 4-70 below.

[31] *Correspondence with Lorrie Lujan, Facilities Planner IUSD, September 28, 2001.*

Table 4-70 Student Enrollment versus Capacity		
School	**Current Enrollment**	**Capacity**
Northwood Elementary School	492	790
Sierra Vista Middle School	792	990
Irvine High School	1,976	2,600
Northwood High School	1,137	2,400
** Northwood High School Current enrollment does not include 12th grade; Fall 2001 320 expected grade enrollment.*		

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on schools if it results in the following:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools.

Project Impacts

District-wide student generation rates as of July 2001 were used to calculate the projected student generation for the Northern Sphere Area, as shown in Table 4-71. Using this generation rate, the construction of 12,350 new homes within the Northern Sphere Area is expected to generate approximately 5,681 additional students. IUSD anticipates the construction of 12,350 new homes in the Northern Sphere Area will generate the need for a minimum of three (3) new elementary schools and one (1) new middle school. Schools assigned to students from the Northern Sphere Area are shown in Table 4-72.

Table 4-71 Student Generation		
	Generation Rate	**Students generated**
K-6	0.3	3,705
7-8	0.06	741
9-12	0.1	1,235
Total		**5,681**
SOURCE: Correspondence with Lorrie Lujan, Facilities Planner, IUSD, August 6, 2001.		

Table 4-72 Assigned Schools for the Northern Sphere Area			
Planning Area	**Level**	**School**	**Approximate Distance from Planning Area**
PA 5B	Elementary (K-6) Middle (7-8) High (9-12)	New Elementary - To be named New Middle School* Irvine High School or Northwood High School	± 0.75 miles ± 1-2 miles ± 2.7 miles ± 2.5 miles
PA 6	Elementary/Middle (K-8) High (9-12)	To be named Northwood High School	TBD ± 6 miles
PA 8A	Elementary (K-6) Middle (7-8) High (9-12)	Northwood Elementary School Sierra Vista Middle School Irvine High School or Northwood High School	± 1 miles ± 2 miles ± 1.5 miles ± 4 miles
PA 9	Elementary (K-6) Middle (7-8) High (9-12)	New Elementary - To be named New Middle School* Irvine High School or Northwood High School	TBD TBD ± 2 miles ± 3 miles
** Presently IUSD owns a site within Planning Area 5B, however, with the introduction of the proposed project, consideration is being given to the relocation of this site.*			

The IUSD and TIC have been meeting on a regular basis to update and complete a Facility and Financing Supplement to a 1985 Mitigation Agreement (Supplement) between IUSD and TIC, to meet the requirements o future development. It is the intent of TIC and IUSD that the Supplement will provide for the financing of K-12 facilities, including classrooms, core facilities, furnishings and equipment, technology equipment, and interim classrooms. Recent changes in State law (SB 50) have established a statewide fee funding program for new school facilities that is legislatively "deemed to be full and complete mitigation of the impacts of any legislative or adjudicatory act ... on the provision of adequate school facilities." (Government Code § 65995(h).) In the event TIC and IUSD are unable to agree upon a Facility and Financing Suppliment, payment of SB 50 fees provides a conclusive presumption that all school related impacts are mitigated to a level of insignificance.

Each year IUSD staff updates the District's enrollment projections for kindergarten through grade 12. The computer generated calculations are based on such factors as the aging of the existing student population, students moving into existing housing, students leaving for other districts, growth in kindergarten as a result of demographic trends, change in attendance boundaries, assumptions of residential units to be built within the District, and various other factors impacting the District's enrollment profile. These projections are used as the basis to plan for construction of new schools or augmentation of existing schools.

General Plan Consistency

Objective G-1 states "Coordinate planning and development of Irvine's public facilities and service with the private sector, University of California, Irvine, the Irvine Unified School District, Orange County and other public agencies." With the implementation of the mitigation measures outlined below, the project will be consistent with this general plan provision.

Cumulative Impacts

According to the 2001 IUSD Ten-Year Enrollment Projections, "between fall 2001 and fall 2011 the IUSD anticipates an 1.45% decrease in K-12 enrollment. Anticipated enrollment growth through 2009 will require the opening of four new elementary or K-8 schools and one new middle school. Plaza Vista Elementary (K-8) and Northwood High School opened in Fall of 1999." As shown on Table 4-73, IUSD expects student enrollment to decrease by 1,307 students by the year 2011.

Table 4-73 Cumulative Enrollment Projections				
Level	**1998 Current**	**1998 Projected**	**2002**	**2007**
Elementary	12,139	12,140	11,640	11,997
Middle	3,894	3,933	4,010	3,550
High	7,588	7,705	7,798	6,762
	23,621	23,778	23,448	22,309

Source: Irvine Unified School District 2001 Annual Facilities report: Ten-Year Enrollment Projections Attendance Areas for 2001-2002 Current and Anticipated Buiding Program, May 25, 2001.

Elementary Schools: Anticipated development south of the San Diego (I-405) Freeway in Planning Areas 17, 18, 22, and 27 will require the opening of two new K-8 schools. Oak Creak is anticipated to open as a year-round school in July of 2002. Cumulative growth in Irvine will require the opening of a K-8 school in Turtle Ridge, a K-8 school in Planning Area 17, and a K-8 school in Tustin; all expected to open between 2004 and 2006.

Middle School: Growth in Irvine will require a new middle school at the northeast end of Northwood by the year 2007.

High School: Northwood High School opened in the Fall 1999, and several changes in existing attendance boundaries have been implemented. Capacity currently exists for future Northern Sphere students and IUSD is project to have sufficient capacity through 2011 to house the new students.

SB50 establishes three potential fee limits for school districts, depending on the availability of new school construction funding from the state and the particular needs of the individual school districts. The current school facilities fee outside the Community Facilities District 86-1 (Mello-Roos District), is $2.05 per sq. ft. for new Residential and $0.33 per sq. ft. for new Commercial/Industrial, which are level one fees. At level three, school fees can be collected to fully fund the costs of any needed new schools. The funding program established by SB 50 has been found by the Legislature to constitute "full and complete mitigation of the impacts of any legislative or adjudicative act … on the provision of adequate school facilities. (Government Code § 65995(h).) To the extent that student needs of the Project and other projects in the service area of IUSD are not addressed in a Facility and Financing Supplement, the fees authorized for collection under SB 50 are conclusively deemed full and adequate mitigation of impacts on to IUSD. The new schools will be sited as required by the State Department of Education so that no significant impacts will result from the construction and operation of the new schools.

Mitigation Measures

Existing Regulations and Standard Conditions

The City of Irvine has no standard conditions of approval related to schools which apply to the proposed Northern Sphere Area General Plan Amendment and Zone Change.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to public school impacts have been proposed.

Additional Mitigation Measures

12.5 Prior to issuance of building permits, mitigation of school impacts will be achieved by either payment of school fees established by SB50, or execution by IUSD and TIC of a Facility and Financing Supplement to the 1985 Mitigation Agreement.

Level of Significance after Mitigation

Significant project-related school impacts are reduced to a level of insignificance through the school impact fee requirements of Government Code Section 65995 and incorporation of the mitigation measures listed above.

4.12.4 PUBLIC LIBRARY SERVICES

Environmental Setting

The Orange County Public Library (OCPL) provides service to the 20 jurisdictions located in Orange County as well as unincorporated areas of the County through 27 library branches. The City of Irvine is serviced by the Heritage Park Regional Library and University Park Library. A standard service ratio has been adopted by the OCPL to determine the number of book volumes and floor area needed to adequately service a given population. The OCPL has adopted a service ratio of 0.2 square feet of library facility floor area per capita (e.g., 10,000 square feet per 50,000 residents), and 1.5 book volumes per capita. The current population in the City of Irvine is approximately 143,072. Based on this population the Heritage Park Regional and University Park Libraries need a combined total of approximately 28,614 square feet of library floor area, and 214,608 book volumes to serve the City of Irvine. These libraries currently have a combined total of 29,097 square feet of library floor area and 260,000 book volumes. Therefore, the Irvine libraries currently exceed the OCPL standards by 483 square feet of floor area and 45,392 books. However, because the Heritage Park Library is a regional facility, it is larger and contains additional books and information to service the entire Orange County region. There is no specific service standard for regional facilities.

Each of the three regional facilities located within the County has a specialty emphasis. The Heritage Park Regional Branch is considered a business branch, and carries a large collection of business related books. Because of this regional designation, it is difficult to determine potential capacity of this facility using the standard floor area and book volume figures used by branch libraries. These numbers are only used as a guide to determine the official library capacity; however, each library has a three mile service radius and the true capacity of each branch is usually based on usage. According to the OCPL, the existing amount of library space is sufficient to serve the existing population.[32] Heritage Park Library has submitted plans to the City for a 2,400 square foot expansion. A third library, Wheeler Ranch, is planned to open May 2003 and will be located at the Orange County Historical Park on the site of the former Irvine Family Home.

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on libraries if it results in the following:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives for libraries.

Project Impacts

The Heritage Park Regional and University Park libraries will serve the project site. The population projected for the proposed project is approximately 34,843. Based on the library service standards, to serve the proposed project the Heritage Park Regional and University Park libraries would need a combined total of approximately 6,969 square feet of library floor area and 52,265 book volumes, as shown on Table 4-74. Although the Irvine public library system currently exceeds the OCPL standards by 483 square feet of floor area and 45,392 book volumes, the Northern Sphere Area would require an additional 6,486 square feet of floor area and 6,873 book volumes. However, with the addition of the 10,000 square foot Wheeler Ranch Library, existing and proposed library facilities can serve the proposed project and no significant impacts are anticipated.

[32] *Correspondence with David Sankey, Director, Financial and Purchasing Services, Orange County Public Library, Letter dated August 15, 2001.*

Table 4-74 Orange County Public Library Facilities (City of Irvine)		
FACILITY	**SQUARE FEET**	**BOOK VOLUMES**
University Park	11,097	112,000
Heritage Park Regional	18,000	148,000
TOTAL	29,097	260,000
Service Standard per Capita	0.2	1.5
Population that can be served by existing facilities	**145,485**	**173,333**
EXISTING DEMAND		
City of Irvine Population (as of January 1, 2001)	143,072	
Estimated population of Northern Sphere Area (12,350 units)	34,843	
TOTAL	177,915	

Cumulative Impacts

At General Plan buildout (projected for the year 2025), the City of Irvine is expected to have a population of approximately 194,913. Population growth will increase the demand for library services beyond the capacity of the existing OCPL system. Based on the projected City of Irvine population, the Irvine libraries would need a total of approximately 38,983 square feet of library floor area and 292,370 book volumes. As a result, library capacity would need to be expanded by approximately 9,886 square feet of floor area and 32,370 book volumes. There are no capital funds designated for the Orange County Public Library system other than development fees. A new library facility is expected to be built in the Foothill Ranch area within the next three to five years and will be funded through development fees. This facility may alleviate some of the future demand, however, the cumulative impact on the library system in the City of Irvine would continue to exist.

In order to serve future cumulative growth, the City of Irvine is currently working with The Irvine Company to plan a new library in north Irvine at the Irvine Agricultural Headquarters located at Irvine Boulevard and Jamboree Road. The new North Irvine Library is being planned by the County of Orange and will consist of approximately 10,000 square feet. In addition, Heritage Park Library has submitted plans to the City for a 2,400 square foot expansion. Therefore, to the extent that library facilities are expanded to serve cumulative development, no significant impacts to the library services are anticipated.

Mitigation Measures

Existing Regulations and Standard Conditions

No mitigation measures are required.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to public library impacts have been proposed.

Additional Mitigation Measures

No additional mitigation measures are required.

Level of Significance after Mitigation

No significant project-specific impacts have been identified. To the extent that library facilities are expanded to serve cumulative development, no significant impacts to the library services are anticipated.

4.13 Recreation

4.13.1 ENVIRONMENTAL SETTING

Existing Parks and Recreation Opportunities

Several parks and recreation facilities are located immediately adjacent to the project site. Thirteen public parks and two recreational trails are located in the adjacent communities of Northwood and Northwood Point. The Northwood Community Park and Venta Spur Trail is located in Northwood. Neighborhood public parks include Citrus Glen Park in Northwood Point; and Alderwood, Blue Gum, Brywood, Carrotwood, Coralwood, Meadowood, Orchard, Pepperwood, Pinewood, and Silkwood parks in Northwood. Hicks Canyon Trail is located in Planning Area 5 and Lower Peters Canyon Trail is located in Planning Area 4. In addition, there are 12 community parks elsewhere in the City, which total over 180 acres, and two special facilities (Bommer Canyon Cattle Camp and Central Bark, a dog park) that total 18 acres. The City has 28 public neighborhood parks and more than 180 private neighborhood parks, along with 114 acres of landscaped recreational trails. In addition to eight landscaped public recreation trails, the City of Irvine offers other recreational facilities, such as the Community Theater. A public trail will also be constructed along Jeffrey Road (Jeffrey Open Space Spine) and Peter's Canyon Wash in a northeasterly direction through Northwood Community and Planning Area 2, northwest of the project site. In addition to these nearby parks and recreation sites, Irvine residents can enjoy a variety of other recreational opportunities that are within a short travel distance. These include: O'Neill Regional Park, Whiting Ranch Wilderness Park, Peter's Canyon Regional Park, Irvine Regional Park, Irvine Lake, Mason Regional Park, Upper Newport Bay Ecological Reserve and Regional Park, Laguna Coast Wilderness Park, Crystal Cove State Park and the Pacific Ocean beaches in Newport Beach, Laguna Beach and Huntington Beach. Finally, through the Conservation and Open Space Element of the City of Irvine General Plan, places like Bommer Canyon, portions of Shady Canyon and Limestone Canyon have been preserved for open space uses on a citywide basis.

City of Irvine Park Standards and Current Inventory of Parks and Recreation Facilities

The City of Irvine requires the dedication of a total of five acres of parks for each 1,000 residents. This standard is applied to new residential developments and is generally met with three acres of neighborhood parkland and two acres of community parkland. Through the acquisition of parkland by dedication and purchase, the City develops park sites in accordance with the following standards:

1. Public neighborhood parks - minimum of four acres in size, excluding greenbelts, off-street trails and school grounds. May provide joint use with elementary schools. Primary uses include passive open space, active play areas, picnic areas, and playing fields.

2. Private neighborhood parks - minimum one-third (.3) contiguous acre in size, excluding greenbelts, trails, windrows, setbacks or other development features, such as swimming

pools, spas, clubhouses and tennis courts. Primary uses include swimming pools, spas, club houses, and tennis courts.

3. Community parks - Generally a minimum 20-acres in size, excluding greenbelts, trails and school grounds. May provide joint use with secondary schools. Will be designed to serve more than one planning area and provide a variety of uses such as swimming pools, athletic fields, community/recreation centers, cultural centers, picnic areas and gardens.

Specific park locations, sizes and improvement requirements for new residential projects are determined in conjunction with tentative subdivision map applications. Park land dedication requirements can be met by dedication of the amount of land dictated by the 5 acres/1,000 persons standard, by payment of fees in-lieu of the land, by construction of park facilities, or by a combination of any of these methods. Private neighborhood parks sites can also be used to satisfy the park land standard, however, such sites must meet size and design standards specified in the City's Subdivision Ordinance in order to receive credit toward fulfilling the park land dedication requirement. Amount of credit allowed is addressed in the Park Standards Manual.

The Parks and Recreation Element of the City's General Plan includes an adopted goal to provide park and recreation opportunities at a level that maximizes available funds and enables residents of all ages to utilize their leisure time in a rewarding, relaxing, and creative manner. In order to accomplish this goal the City developed Parks and Recreation Objectives, which are further supported by policies.

The objective most relevant to the proposed project is **Objective K-1: Recreational Opportunities.** This objective states:

> *Provide for a broad spectrum of recreational opportunities and park facilities, in either public or private ownership, to accommodate a variety of types and sizes of functions; as discussed in the Parks and Recreation Element of the General Plan.*

Currently, there are approximately 506 acres of neighborhood and community parks and recreational trails in the City of Irvine's public park system. This includes one aquatics complex containing three competition size pools, located at Heritage Park near the intersection of Yale Avenue and Walnut Avenue, just south of the Santa Ana (I-5) Freeway. William R. Mason Regional Park, a County of Orange facility, and numerous private parks and recreation facilities are also available throughout Irvine that provide additional recreational opportunities for the City's residents.

The project area includes a 117-acre strip of land along Jeffrey Road that is designated for Recreation in the City's General Plan. Under the proposed project, this strip along Jeffrey Road would remain designated for Recreation, as the Jeffrey Road Open Space Spine.

Recreational facilities in the surrounding area include a golf driving range within Planning Area 9 near the intersection of Trabuco Road and Jeffrey Road, and the Oak Creek Golf Course south of the project area, across the I-5 Freeway. There are 16 parks within one mile of the project area. Heritage Park is adjacent to Irvine High School and includes the Fine Arts Center, Youth Services Center, Aquatics Complex and Child Care Center. Northwood Community Park is located in the Village of Northwood and provides a range of outdoor recreational activities as well as indoor services. These facilities, along with Ranch Park and Sycamore Park, are among the larger park/recreation areas in the project vicinity; the remaining parks are smaller neighborhood parks.

Planned Parks and Recreation Opportunities

City of Irvine Community Parks Master Plan

A master plan for existing and future community parks was adopted in 1988 to guide the City's efforts to create a community park system that will help achieve the City's goals for meeting the recreational needs of its current and future residents. This plan is conceptual in nature and is not intended to dictate exact locations, sizes and range of activities for development of individual parks. Rather, the purpose of the Community Parks Master Plan (CPMP) is to provide the planning framework for a comprehensive network of community parks based on the ultimate development of the City in accordance with the Irvine General Plan. The master plan was adopted in October, 1988 based on the General Plan in effect at that time. The General Plan has been revised several times since then, and an update to the Community Parks Master Plan is anticipated to be initiated within the next year to reflect the current General Plan.

Northern Sphere Area

City of Irvine Master Bicycle Transportation Plan

As per the General Plan, a Class I (off-street) bicycle trail is planned along the eastern side of Jeffrey Road. The Jeffrey Bike trail will run in a northeasterly direction from south Irvine to the Santiago Hills. The Venta Spur Trail, a Class I trail, links the Northwood (Planning Area 8) Community to Jeffrey Road.

Class II (on-street) bicycle trails exist along Sand Canyon Avenue, Trabuco Road, Irvine Boulevard, and Portola Parkway.

Exhibit 4-49 Master Plan of Countywide Bikeways

Although not included on the City of Irvine Master Plan of Bicycle Trails, the County of Orange has several proposed trails in the area, including: 1) the Borrego Wash Trail Bikeway along Alton Parkway south of MCAS El Toro to Portola Parkway; and 2) the Peter's Canyon Wash Bikeway along Peter's Canyon Wash extending north past Irvine Park to Featherly Park. The Master Plan of Countywide Bikeways are shown in Exhibit 4-49.

City of Irvine Trails Network

There are many bikeways in the vicinity of the project site. On a regional scale these include Peters Canyon, Atcheson Topeka and Santa Fe, San Diego Creek, Woodbridge Lakes, I-405, Hicks Canyon, and Borrego Canyon Bikeways. There are also several local bikeways, including the Jeffrey, Sand Canyon, and Venta Spur Bikeways. Cycle commuters would be expected to take these local and regional routes from residential areas in Tustin, Irvine, and Lake Forest to the future employment centers at the project site. A riding and hiking trail extends from Portola Parkway north through Implementation District "P" and east continuing along Portola Parkway through the former El Toro MCAS.

4.13.2 ENVIRONMENTAL IMPACTS

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on recreation if it results in the following:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

- Inclusion of recreational facilities, or the construction or expansion of recreational facilities within the project which might have an adverse physical effect on the environment.

Project Impacts

At full buildout of this project, approximately 34,843 persons would reside within the Northern Sphere Area (see Section 4.11 for calculations). This number is based on the proposed zoning categories and the number of units proposed within the residential zoning district. Project population estimates will be recalculated, in conjunction with residential tentative tract maps, when actual lot sizes and housing unit types/sizes will be defined. Population calculations will be further derived by factors adopted by the City in accordance with Government Code Section 66477 (Quimby Act). Given this assumption, a project population of 34,843 persons would require approximately 174 acres of neighborhood and community park area, based on the City's standard of 5 acres of parkland per 1,000 residents. Of this amount, the City's park standards would typically require that this

acreage be split between an approximately 70-acres of community parks, 104-acres of public/private neighborhood parks, and smaller public and private parks. As long as this project provides at least the minimum required amount of parkland within the Northern Sphere Area, the project would not result in significant impacts on existing recreational opportunities within the City.

According to the zone change application, the public neighborhood park program will provide both passive and active recreational opportunities. Neighborhood park acres dedicated with new development will ensure that new parks will be available to new residents and thus the project will not cause increased use of existing neighborhood parks. Therefore, the proposed project will not adversely impact existing neighborhood parks. Similarly, community park acres will be dedicated with development. Historically, the City has balanced diverse and citywide needs through its overall Community Park program. That program has resulted in parks ranging from passive nature oriented facilities to very intense and active athletic complexes. As the City grows and changes, the City itself will determine program elements for the Community Parks required by development within the project area. It is through this process that citywide recreational needs will be addressed and the balance will continue. The addition of parkland within the project area will thus enhance the overall Community Park Program and will therefore not have an adverse impact on existing community parks.

The exact number, precise location, configuration and size of community and neighborhood parks and the distribution of public and private parks will be established at the time of development. Preliminary parks and schools locations identified by the landowner are illustrated in Exhibit 4-50.

The Jeffrey Open Space Spine, totaling approximately 117-acres within the project site, has been planned since 1988 to provide a continuous open space edge of variable width along the eastern side of the ultimate alignment of Jeffrey Road. According to the Memorandum of Understanding (MOU) between the City of Irvine and the Irvine Company, the Jeffrey Open Space Spine is to be dedicated by the developer as open space. Except for utilities and general plan roadway improvements, surface uses will be limited to trails and associated passive public recreation and park and ride facilities, as described in Appendix L of the City of Irvine General Plan (1999). The General Plan, Appendix L, states the following regarding the development of the Jeffrey Open Space Spine:

> *Between I-5 and the Preservation Area in the Lomas de Santiago Ridge, the spine will average 300 feet in width. The [Irvine] Company acknowledges the importance of completing the Jeffrey Spine between the I-5 and the Lomas de Santiago Hills. The Company agrees to include plans for the spine with future development programs for the land easterly of the spine in Planning Areas 6 and 9…*

Exhibit 4-50 Preliminary Parks and Schools Location Map

A subsequent agreement between the County of Orange and The Irvine Company added 25' to the average width of the Jeffrey Open Space Spine. The acreage to be dedicated for the open space spine is subject to refinement during the development process. To ensure compliance with this General Plan Policy, a mitigation measure has been included under which The Irvine Company will be required to submit a conceptual plan for the Open Space Spine, as described in Objective L-9 Policy (d), including descriptions of types of trails, landscape elements and special design features. The conceptual plan would be reviewed and approved by the City of Irvine prior to development.

The construction of the trail and infrastructure necessary to serve adjacent development are the responsibility of the developer. The MOU states The Irvine Company is responsible for "utilities and infrastructure necessary to serve [The Irvine] Company development and also the permanent trail construction." The City of Irvine is responsible for funding the improvements to the spine with landscaping that is compatible and complimentary to adjoining development (Stanley R. Hoffman Associates 2000). In conclusion therefore, the dedication and implementation of the Open Space Spine will add to and help complete the planned trail network positively affecting the regional trail plan and thus will not adversely impact the existing system.

The OCTA is planning to revise the 1995 Commuter Bikeways Strategic Plan and may be adding regional Class I bikeways in the Irvine area. OCTA is currently gathering input from the cities and the County regarding this revision. In August 2001, the County approved the addition of regional Class I bikeways along Sand Canyon Avenue, Trabuco Road, and Jeffrey Road.

Class I (off-street) bicycle trails are proposed along Jeffrey Open Space Spine in a northeast direction through Lomas de Santiago Hills and connecting to the Hicks Canyon Trail, which will run along Portola Parkway west of Jeffrey Road. The Hicks Canyon Trail will also be extended through the proposed project adjacent to Portola Parkway. Class II (on-street) bicycle trails are also required along Trabuco Road, Irvine Boulevard, Portola Parkway, and Sand Canyon Avenue. These conceptual alignments are consistent with the City's Trails Network and County's Master Plan of Riding and Hiking Trails. The actual trails program will be determined by the Master Trials Plan which will be submitted prior to approval of the first residential Tentative Tract Map within each planning area, consistent with adopted City and County plans. As a result, no significant impacts to trails are anticipated.

Finally, on a regional perspective, the City of Irvine through its Conservation and Open Space Element has established an open space program comprehensively aggregating open space, adjoining other regional open space, promoting conservation and passive recreational opportunities (e.g. Bommer Canyon, Shady Canyon and Limestone Canyon). With the proposed project 1,600 acres will be added to the northern open space areas. Furthermore, as noted above, the completion of the Jeffrey Open Space Spine will link open space areas allowing for managed and enhanced use of these resources. The additional open space and trail connections will have a positive effect on this regional recreational opportunity and therefore will not adversely impact regional resources.

Inclusion of parks within the project area has been evaluated in context with other physical effects associated with residential development, which in fact requires parkland dedication. For example, the evaluation of grading, infrastructure, and other construction related impacts addressed elsewhere in this DEIR for residential development apply to park development as well. Mitigation measures and standard city policies and procedures applied to reduce development related impacts likewise apply to park development. As noted above it is likely that at least some of the parks will be night lighted facilities. As also noted in Section 4.1 however, the potential for night-lights has been recognized and evaluated. Through the imposition of Mitigation Measures listed in Section 4.1.3 the impact of these lights can be mitigated to a level of insignificance. Therefore, with implementation of mitigation measures specifically related to parks and recreation impacts as well as measures applied to development covered elsewhere in this DEIR, physical impacts associated with parkland dedication and improvement are reduced to a level of insignificance.

Cumulative Impacts

Recreational needs of future residents of the Northern Sphere Area and other cumulative development in accordance with the adopted General Plan, including employees from the nearby Irvine's Spectrum, would add to city-wide and regional demand for parks and recreation opportunities. However, each project within the City of Irvine is required to comply with the City's parkland dedication requirements as contained in the Subdivision Ordinance. As a result, new parks and trails are developed as residential development occurs. Therefore, no significant cumulative impacts related to recreational opportunities are anticipated.

4.13.3 MITIGATION MEASURES

Existing Regulations and Standard Conditions

13.1 Concurrent with submittal of the first residential tract map for each Planning Area, the landowner or subsequent project applicant shall submit a park plan for private and public parks and trails to be provided throughout that Planning Area. This plan shall satisfy all standards of the City's Subdivision Ordinance relative to parks and trails locations, sizes and design criteria, and shall be based upon the actual individual project densities proposed for all housing projects.

13.2 This development necessitates the construction of public and/or private infrastructure improvements. Prior to the release of a final map by the City, the landowner or subsequent project applicant shall construct, or enter into an agreement and post security, in a form and amount acceptable to the City Engineer, guaranteeing the construction of riding, hiking and bicycle trails adjacent to or through the project site, in conformance with applicable City standards and the City's Capital Improvement Policy. (Standard Condition 1.1)

13.3 This development includes land that encompasses or lies within an Open Space Implementation Action Program District as shown on the City's General Plan and Zoning Ordinance. Prior to the release of a final map by the City, the landowner or subsequent project applicant shall submit an irrevocable offer of dedication for the preservation open space lot and/or easement, as required by the City's Phased Dedication and Compensating Development Opportunities Program. A copy of the irrevocable offer shall be submitted to both the City Engineer and the Director of Community Development. The irrevocable offer of dedication for the preservation open space lot and/or easement shall be prepared to the satisfaction of the Director of Community Development, the City Engineer, and the City Attorney. The offer shall be recorded with filing of the final map. (Standard Condition 1.7)

13.4 This development includes public trails which the City Engineer may permit to be recorded separately from the final map. Prior to the issuance of the first precise grading permit, the landowner or subsequent project applicant shall submit to the City Engineer and the Director of Community Services all documents ready for recording of such easements. (Standard Condition 2.7)

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to recreation impacts have been proposed.

Additional Mitigation Measures

13.5 Prior to the approval of the Tentative Tract Map, the landowner or subsequent project applicant shall submit a conceptual design for the detention basins, drainage facilities, and water treatment facilities if they are located within the open space, that includes a habitat/recreation/open space compatibility element. Final conceptual design of the habitat/recreation/open space compatibility element for the detention basins shall be subject to the approval of the Director of Community Services. All such facilities which are located on land that is ultimately to be owned by the City shall be required to obtain review and approval by the Director of Community Services during Public Facility Design Review.

13.6 Prior to approval of the first residential Tentative Tract Map within each planning area, the landowner or subsequent project applicant shall submit a Master Trails Plan which addresses public and private trails and linkages, public view points, public access points to the open space, signage, and construction phasing of trails for that planning area. The Master Trails Plan shall specify trail locations and types, ownership and maintenance, and a phasing plan for construction of trails. The Master Trails Plan shall be submitted for review and comment by the County of Orange and Community Services Commission and approved by the Planning Commission.

13.7 In conjunction with the submittal of master tentative tract map(s) for areas adjacent to the Jeffrey Open Space Spine, the landowner or subsequent project applicant shall submit for review, to the satisfaction of the Director of Community Development, Director of Community Services and the City Attorney, in the form of an irrevocable offer of dedication to the City of Irvine for the Jeffrey Open Space Spine. The Jeffrey Open Space Spine shall be identified on said master tentative tract map as lettered lots. The irrevocable offer of dedication shall then be accepted by the City and recorded in conjunction with the recordation of the final tract map(s) containing open space lots.

13.8 Prior to the release of a final map by the City for Planning Area 9, and consistent with approved zoning, the landowner or subsequent project applicant shall be required to submit for the review and approval of the Community Development Department and Community Services Department a conceptual plan for the Jeffrey Open Space Spine, including descriptions of types of trails, landscape elements and special design features.

4.13.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the standard conditions of approval and mitigation measures listed above would reduce potentially significant impacts related to recreation to a level of insignificance.

4.14 Transportation/Traffic

The traffic study for the proposed project was prepared by Austin-Foust Associates, Inc. dated on November 2001, and is contained in its entirety in Appendix N. Please refer to Appendix N for a more detailed description of study methodology and glossary of terms.

4.14.1 ENVIRONMENTAL SETTING

Analysis Scope and Methodology

Exhibit 4-51 shows the project site and the study area used for this traffic analysis. The traffic analysis study area was determined based upon preliminary forecasts of the project area and includes portions of the Cities of Irvine, Tustin, Orange and Lake Forest and unincorporated county and is bounded by Jamboree Road from I-5 to Chapman Avenue/Santiago Canyon Road, Santiago Canyon Road to Jeffrey Road, Jeffrey Road to SR-241, SR-241 to Portola Parkway, Portola Parkway to Bake Parkway, Bake Parkway to Irvine Center Drive, Irvine Center Drive to Lake Forest Drive, Lake Forest Drive to SR-133, SR-133 to Old Laguna Canyon Road, Old Laguna Canyon Road to "B" Street, "B" Street to Sand Canyon Avenue, Sand Canyon Avenue to Alton Parkway, Alton Parkway to Culver Drive, Culver Drive to I-5 and I-5 to Jamboree Road. Within this area, the traffic impacts on the circulation system are identified. Also, in response to requests made by the City of Lake Forest and the City of Irvine's Transportation and Infrastructure Commission certain intersections outside this defined study have also been included. Preliminary traffic forecasts also indicated the need to include additional intersections outside the defined study area because of project impacts along the periphery. The 16 intersections outside the defined study area also analyzed in this report are as follows:

Additional intersections near periphery of defined study area:
Newport Avenue at Irvine Boulevard
Red Hill Avenue at Irvine Boulevard
Browning Avenue at Irvine Boulevard
Tustin Ranch Road at Irvine Boulevard

Requests by City of Irvine's Transportation and Infrastructure Commission:

Jamboree Road Southbound and Northbound at Walnut Avenue
Jamboree Road at Edinger Avenue
Jamboree Road Southbound and Northbound at Warner Avenue
Jamboree Road at Barranca Parkway
Culver Drive at I-405 Northbound and Southbound Ramps
Culver Drive at University Drive
Jeffrey Road/University Drive at I-405 Northbound and Southbound Ramps

Exhibit 4-51 Traffic Study Area Boundary

Requests by City of Lake Forest:

Lake Forest Drive at Portola Parkway

This traffic analysis addresses the proposed project in three time frames. The first is for 2007, and represents the amount of growth that is projected to occur in the next five to seven years. This 2007 time period is consistent with County Growth Management Plan (GMP) and Congestion Management Program (CMP) guidelines.

The second time frame is for 2025 with two separate circulation systems assumed: 1) a circulation system which assumes only those improvements which exist or are committed for construction (i.e., public agency Capital Improvement Programs, state transportation improvement program, etc.) or would be constructed as part of previously entitled development by this time frame (referred to as "2025 constrained"); and 2) buildout of the circulation system in accordance with the City of Irvine's General Plan and County of Orange MPAH (referred to as "2025 buildout"). For year 2025, completion of the project and toll conditions on the SR-133 (north of I-5), SR-241 and SR-261 are assumed. Within the City of Irvine, land use assumptions for the year 2025 were provided by the City. Outside the City of Irvine, Orange County Projections 2000 (OCP-2000) were utilized with the following exceptions:

1) The recently approved City of Irvine Millennium Plan II (land uses and circulation) was used for the former Marine Corps Air Station (MCAS) El Toro site. It should be noted that a separate sensitivity analysis is presented which reflects a 28.8 million annual passengers (MAP) aviation alternative for the former MCAS El Toro site.

2) The recently approved City of Tustin's proposed reuse (land uses and circulation) of the former MCAS Tustin site is assumed.

3) The recently approved Santiago Hills II development was assumed in East Orange just north of the project (see Reference 15), and the remainder of the East Orange area is based on land uses presented in the East Orange General Plan Environmental Impact Report (EIR).

4) Updated land uses in the Tustin Ranch area in the City of Tustin north of the project reflects existing and approved land uses.

5) City of Irvine land uses are assumed for Planning Areas 1 and 2, which are in the City's sphere.

The third time frame is for Post-2040 and is based on the full implementation of the City of Irvine's MPAH and adopted General Plan land uses and buildout of the surrounding land uses. Toll-free conditions are assumed on the SR-133 (north of I-5), SR-241 and SR-261. For this time frame, the

City's General Plan (GP) land use and circulation information adopted by the City in March 2000 was utilized. OCP-2000 socioeconomic projections and County of Orange MPAH circulation system with the same exceptions outlined for year 2025 are reflected outside the City. Land uses according to the East Orange General Plan have also been included.

The forecasts are based on an adopted version of the City of Irvine's traffic model, the Irvine Transportation Analysis Model (ITAM) 3.01. ITAM 3.01 has been updated to include additional analysis roadway link and intersection locations within the City of Irvine and the surrounding area. The distances assumed for Culver Drive and Jeffrey Road north of Portola Parkway have been based on conceptual alignment studies for those facilities. The updated model also has incorporated the Orange County Projections 2000 (OCP-2000) socioeconomic growth projections for the unincorporated county areas and local jurisdictions' updated General Plans, as available, into the forecasts and has been re-calibrated with a year 2000 validation. ITAM is based on the countywide "parent" traffic model, the Orange County Transportation Analysis Model (OCTAM) 3.1 and is the principal tool for transportation planning in the City of Irvine.

Performance Criteria

The traffic analysis utilizes a set of performance criteria for evaluating roadway and intersection capacity to determine potential project impacts. The performance criteria adopted by the City of Irvine in May 1992 are summarized in Table 4-75. Also included here are the criteria used in this traffic analysis for other jurisdictions within the study area. The performance criteria include an intersection capacity utilization (ICU) analysis and an arterial link analysis. The intersection capacity analysis examines AM and PM peak hour volumes and ICUs at the intersections being studied in the defined study area. It should be noted that the ICU methodology is used for planning purposes as opposed to the Highway Capacity Manual methodology which is used more as an operational tool. In addition, the ICU methodology is consistent with City of Irvine guidelines for impact analyses. The arterial link analysis uses ADT volumes and involves the calculation of volume/capacity (V/C) ratios.

Caltrans, in their comments to the Notice of Preparation (NOP) for this project, has requested that the project traffic analysis assess impacts to the freeways and tollways. As a result, freeway/tollway mainline and ramp forecast data are presented and those locations not meeting the criteria summarized in Tables 4-76 and 4-77 will be identified. The criteria presented here for freeway/tollway mainline and ramp analyses have been used by other jurisdictions. For General Plan/Zoning land use development proposals and analyses used by jurisdictions, levels of service for mainline freeway and tollway segments determined in this analysis are based on V/C ratios and level of service (LOS) relationships specified in the 2000 Highway Capacity Manual (HCM). The approach in the V/C assessment of freeway/tollway mainline segments is consistent with the level of planning analysis typically conducted for environmental impact analyses. It should be noted that no additional mainline capacity has been assumed for auxiliary lanes that are located between the

on-ramp and off-ramp of two adjacent interchanges (i.e., auxiliary lanes that do not extend beyond two adjacent interchanges).

Table 4-75
Traffic Analysis Performance Criteria

I. ADT ARTERIAL LINK VOLUMES

Level of Service to be determined based on average daily traffic (ADT) volume-to-capacity (V/C) ratios using the following ADT capacities:

City of Irvine

Major Arterial	8 lane	72,000		
	6 lane	54,000	6 lane (augmented)	65,000
Primary Arterial	4 lane	32,000	4 lane (augmented)	42,000
Secondary Arterial	4 lane	28,000		
Commuter	2 lane	13,000		

City of Orange

Major Arterial	6 lane	56,300	augmented (8 lane)	75,000
Primary Arterial	4 lane	37,500	augmented (6 lane)	56,300
Secondary Arterial	4 lane	24,000	augmented (4 lane)	37,500
Collector	2 lane	15,000		

Cities of Tustin and Lake Forest and County of Orange

Major Arterial	6 lane	56,300	6 lane (augmented)	67,600
Primary Arterial	4 lane	37,500	4 lane (augmented)	45,000
Secondary Arterial	4 lane	25,000	4 lane (augmented)	30,000
Collector	2 lane	12,500		

Performance Standard

Non-CMP or non-Irvine Center (PA33) roadways - Level of Service D (ADT V/C less than or equal to .90)
CMP or PA33 roadways - Level of Service E (ADT V/C less than or equal to 1.00)

Mitigation Requirement

For V/C greater than the acceptable level of service, mitigation of the project contribution is required to bring link location back to acceptable level of service or to no-project conditions if project contribution is greater than .01 or greater than .03 for CMP roadways).

Table 4-75
Traffic Analysis Performance Criteria

II. PEAK HOUR INTERSECTION CAPACITY UTILIZATION (ICU)

Level of service to be based on peak hour ICU values calculated using the following assumptions:

Saturation Flow Rate: 1,700 vehicles/hour/lane
Clearance Interval: .05
Right-Turn-On-Red Utilization Factor:* .75 for City of Orange, City of Irvine and City of Tustin intersections, .00 for County of Orange intersections

* "De-facto" right-turn lane is used in the ICU calculation if 19 feet from edge to outside of thru-lane exists and parking is prohibited during peak periods.

Performance Standards

Non-CMP or PA33 intersections - Level of Service D (peak hour ICU less than or equal to .90)
CMP or PA33 intersections - Level of Service E (peak hour ICU less than or equal to 1.00)

Mitigation Requirement

For ICU greater than the acceptable level of service, mitigation of the project contribution is required to bring intersection back to acceptable level of service or to no-project conditions if project contribution is greater than .03 at CMP locations (the impact threshold specified in the CMP), greater than .01 at City of Orange, City of Irvine, City of Tustin and City of Lake Forest locations, and .01 or greater at County of Orange locations (the impact threshold specified in the GMP).

Abbreviations:

CMP - Congestion Management Program
GMP - Growth Management Plan

Table 4-76
Freeway/Tollway Mainline Performance Criteria

V/C Calculation Methodology

Level of service to be based on ADT volume/capacity (V/C) ratios calculated using the following capacities per City of Irvine Traffic Study Guidelines:

21,000 average vehicles per day per lane for freeway segment with 10 or more lanes
22,000 average vehicles per day per lane for freeway segment with 8 lanes
22,500 average vehicles per day per lane for frreway segment with 4 to 6 lanes

Performance Standard

Level of Service E (peak hour V/C less than or equal to 1.00)

Threshold of Significance

If based on a comparison with the No Project scenario, a project alternative V/C increase is greater than 0.03 (the impact threshold specified in the CMP) for a freeway/tollway mainline segment that is forecast to operate worse than the performance standard, then the impact of that project alternative is considered significant.

Abbreviations:

ADT - average daily traffic
CMP - Orange County Congestion Management Program

Table 4-77
Freeway/Tollway Ramp Performance Criteria

V/C Calculation Methodology

Level of service to be based on peak hour volume/capacity (V/C) ratios calculated using the following ramp capacities:

Freeway to Arterial Road Interchanges

Metered On-Ramps

1. A maximum capacity of 900 vehicles per hour (vph) for a one-lane metered on-ramp with only one mixed-flow lane at the meter.
2. A maximum capacity of 1,080 (20 percent greater than 900) vph for a one-lane metered on-ramp with one mixed-flow lane at the meter plus one HOV preferential lane at the meter.
3. A maximum capacity of 1,500 vph for a one-lane metered on-ramp with two mixed-flow lanes at the meter.
4. A maximum capacity of 1,800 vph for a two-lane metered on-ramp with two mixed-flow lanes at the meter.

Non-Metered On-Ramps and Off-Ramps

1) A maximum capacity of 1,500 vph for a one-lane ramp.
2) A maximum capacity of 2,250 (50 percent greater than 1,500) vph for a two-lane on-ramp that tapers to one merge lane at or beyond the freeway mainline gore point and for a two-lane off-ramp with only one auxiliary lane.
3) A maximum capacity of 3,000 vph for a two-lane on-ramp that does not taper to one merge lane and for a two-lane off-ramp with two auxiliary lanes.

Freeway to Freeway Interchanges

- A maximum capacity of 2,000 vph for a one-lane ramp
- A maximum capacity of 4,000 vph for a two-lane ramp

Performance Standard

Level of Service E (peak hour V/C less than or equal to 1.00)

Thresholds of Significance

For a freeway ramp that is forecast to operate worse than the performance standard, the impact of a given project alternative is considered to be significant if, based on a comparison with the No Project scenario, the project alternative V/C increase is as follows:

0.01 or greater for ramps at County of Orange intersections (the impact threshold specified in the GMP).
0.02 or greater for ramps at Cities of Orange, Irvine, Tustin and Lake Forest intersections.
Greater than 0.03 for ramps at CMP intersections (the impact threshold specified in the CMP).

Abbreviations:

CMP - Orange County Congestion Management Program
GMP - Orange County Growth Management Plan

Source: July 1995 *Caltrans Highway Design Manual* and the January 2000 *Caltrans Ramp Meter Design Manual*

The ramp capacities described in Table 4-77 are applied to freeway and tollway ramps throughout the traffic analysis study area with the exception of the northbound direct-on ramp at the I-5/Bake Parkway interchange. None of the various on-ramp configurations listed in Table 4-77 accurately describes the existing northbound direct on-ramp from Bake Parkway since it is a two-lane on-ramp that extends for over one-half of a mile (essentially as part of the I-5/I-405 interchanges' collector/distributor roadway system) before tapering to a single lane that becomes an I-5 auxiliary

lane. Also, although a meter is installed on the ramp, the meter is not currently activated during the AM and PM rush hours. Based on preliminary discussions with Caltrans Staff regarding an appropriate capacity to assume for this particular on-ramp, it is estimated that this ramp provides a carrying capacity roughly equivalent to that of a mainline freeway lane in an area of heavy merge/diverge activity (approximately 1,700 vehicles per hour (vph)). Accordingly, a capacity of 3,400 vehicles is applied for the northbound direct on-ramp at the Bake Parkway/I-5 interchange.

The ramp capacities identified here correspond to LOS "E" conditions and are applied in this analysis to calculate peak hour ramp V/C ratios. As presented in Table 4-77, LOS "E" (V/C less than or equal to 1.00) is the performance standard that is applied to freeway and tollway ramps. In other words, a freeway or tollway ramp is considered deficient (LOS "F") when the V/C ratio is greater than 1.00.

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system. These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), and the Orange County Transportation Authority (OCTA) Measure M program.

The TCA has adopted a Major Thoroughfare and Bridge Fee Program in which new development is required to pay a corridor fee at issuance of building permits. The purpose of the fee program is to assure that new development pays its fair share cost towards construction of the ultimate Corridor improvements. The corridor fee revenue can be used to construct additional improvements to the existing transportation corridor system. Based on current fee rates, the Protocol development would contribute approximately $75,000,000 in new Corridor fees. In addition, project traffic would increase the amount of toll revenue that the TCA obtains from operation of the Corridors.

The STIP is a four-year expenditure plan that defines how state transportation funds will be allocated. The source of these funds is primarily from state and federal gas taxes. The STIP funds are used for different projects ranging from road maintenance to new freeway construction. Each County is guaranteed a minimum amount of STIP funds.

TOPS is a program recently implemented by Caltrans to maximize utilization of the existing freeway and tollway system through performance-based investment strategies. The Caltrans' April 2000 TOPS report defines three different phases or levels of strategy within the TOPS program. Level 1 includes implementation of "intelligent infrastructure" improvements such as system-wide adaptive ramp metering, advanced traveler information systems and real-time performance measurement systems. Level 1 also includes the implementation of physical operational improvements such as the construction of freeway auxiliary lanes (merge lanes provided before and after on-ramps), the

modification of ramp/city street access and the addition of short passing lanes and truck climbing lanes.

Orange County has supplemented their transportation programs by implementing a county sales tax for transportation improvements through the Measure M program. Funds from this program are available for improvements to regional interchanges and arterial highways.

It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of the above discussed programs.

The performance criteria specifies levels of service on the arterial highway system. Traffic levels of service (LOS) are designated "A" through "F." Table 4-78 summarizes the V/C ranges that correspond to LOS "A" through "F" for arterial roads and freeway segments. The V/C ranges listed for arterial roads are designated in the Orange County Congestion Management Program (CMP) as well as the General Plans for the County of Orange and the cities within the study area. The V/C ranges listed for freeway segments are based on the V/C and LOS relationships specified in the 2000 Highway Capacity Manual (HCM 2000) for basic freeway sections.

Table 4-78
Volume/Capacity Ratio Level of Service Ranges

Volume/Capacity (V/C) Ratio Range	Level of Service (LOS)
ARTERIAL ROADS	
0.00 - 0.60	A
0.61 - 0.70	B
0.71 - 0.80	C
0.81 - 0.90	D
0.91 - 1.00	E
Above 1.00	F
FREEWAY/TOLLWAY SEGMENTS	
0.00 - 0.30	A
0.31 - 0.50	B
0.51 - 0.71	C
0.72 - 0.89	D
0.90 - 1.00	E
Above 1.00	F

The target level of service (LOS) for arterial links and intersections is "D" or better (or LOS "E" for a CMP identified location or locations in Planning Areas 33 and 36), which is equivalent to a maximum ICU value of .90 (or 1.00 for CMP, PA33 and PA36 locations). It is important to note that exceeding the target V/C ratio does not necessarily indicate a deficiency. Specific guidelines

included in the City of Irvine's peak hour link capacity analysis are followed for assessing facility performance when link locations exceed these target LOS.

Tables 4-79, 4-80 and 4-81 summarize the general LOS descriptions for arterial highways, intersections and freeways, respectively.

Table 4-79
Level of Service Descriptions - Urban Streets

The average travel speed along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section, or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections. The following general statements characterize LOS along urban streets and show the relationship to free flow speeds (FFS)

LOS	DESCRIPTION	PERCENT OF FFS
A	LOS A describes primarily free-flow operations at average travel speeds, usually about 90 percent of the FFS for the given street class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is normal.	90
B	LOS B describes reasonably unimpeded operations at average travel speeds, usually about 70 percent of the FFS for the street class. Vehicles are completely unimpeded in their ability to maneuver with the traffic stream. Control delay at signalized intersection is minimal.	70
C	LOS C describes stable operations; however, ability to maneuver and change lane in midblock locations may be more restricted than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the FFS for the street class	50
D	LOS D borders on a range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40 percent of FFS.	40
E	LOS E is characterized by significant delays and average travel speeds of 33 percent of less of the FFS. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.	33
F	LOS F is characterized by urban street flow at extremely low speeds, typically one-third to one-fourth of the FFS. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.	25

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council

Table 4-80
Level of Service Descriptions - Signalized Intersections

Levels of service (LOS) for signalized intersections are defined in terms of control delay as follows:

LOS	DESCRIPTION	DELAY PER VEHICLE (secs)
A	LOS A describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.	< 10
B	LOS B describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than the LOS A, causing higher levels of delay.	10 - 20
C	LOS C describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level.. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	20 - 35
D	LOS D describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable prorression, long cycle lengths, and high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35 - 55
E	LOS E describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent.	55 - 80
F	LOS F describes operations with control delay in excess of 80 seconds per vehicle. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high V/C ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.	> 80

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council

Table 4-81
Level of Service Descriptions - Freeways

LOS	DESCRIPTION
A	LOS A describes free-flow operations. Free-flow speeds (FFS) prevail. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The effects of incidents or point breakdowns are easily absorbed at this level.
B	LOS B represents reasonably free-flow, and FFS are maintained. The ability to maneuver with the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents and point breakdowns are still easily absorbed.
C	LOS C provides for flow with speeds at or near the FFS of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage.
D	LOS D is the level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.
E	At its highest density value, LOS E describes operation at capacity. Operations at this level are volatile, because there are virtually no usable gaps in the traffic stream. Vehicles are closely spaces, leaving little room to maneuver with the traffic stream at speeds that still exceed 49 miles per hour. Any disruption of the traffic stream, such as vehicles entering from a ramp or a vehicle changing lanes, can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious breakdown with extensive queuing. Maneuverability with the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is poor.
F	LOS F describes breakdowns in vehicular flow. Such conditions generally exist within queues forming behind breakdown points, and are the result of a bottleneck downstream point. LOS F is also used to describe conditions at the point of the breakdown or bottleneck and the queue discharge flow that occurs at speeds lower than the lowest speed for LOS E, as well as the operations within the queue that forms upstream. Whenever LOS F conditions exist, they have the potential to extend upstream for significant distances.

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council

Existing Roadway Network

The existing arterial highway system in the study area is illustrated in Exhibit 4-52 Shown here are the current midblock lanes. Current average daily traffic (ADT) volumes and volume/capacity (V/C) ratios are illustrated in Exhibit 4-53. It should be noted that the existing traffic count data presented in this report (roadway link and peak hour intersection turn movements) are available at the City of Irvine Public Works Department. The arterial volumes are traffic counts carried out in late 2000, early 2001. The volumes on the I-5, I-405, SR-133, SR-241 and SR-261 are from 2000 counts provided by Caltrans and the Transportation Corridor Agencies.

The V/C ratios given here for the existing arterial system are based on the ADT capacity values listed previously under the performance criteria. According to the criteria outlined previously, all arterials in the study area are operating at an acceptable level of service with exception of the following seven roadway link locations:

Roadway Segment	Lanes	ADT	Capacity	V/C	LOS
Jamboree Road south of I-5	6	60,000	54,000	1.11	F
Bake Parkway between I-5 and Rockfield Boulevard	8	69,000	72,000	.96	E
Bake Parkway between Muirlands Boulevard and Jeronimo Road	6	56,000	54,000	1.04	F
Bake Parkway between Jeronimo Road and Toledo Way	6	49,000	54,000	.91	E
Bake Parkway between Irvine Bl/Trabuco Road to Commercentre Dr	4	39,000	37,500	1.04	F
Bake Parkway north of Commercentre Drive	4	34,000	37,500	.91	E
Laguna Canyon south of Old Laguna Canyon Road	3	29,000	24,000	1.21	F

Peak hour intersection turn movement counts were assembled for the intersection locations shown in Exhibit 4-54. The ICU methodology assumes that intersections are signalized. According to the criteria outlined previously, all locations with exception of seven intersections in the study area are operating at or below the target LOS. These intersections are:

Intersection	Peak Hour	ICU	LOS
Jamboree Road at Barranca Parkway	AM	1.09	F
Culver Drive at Trabuco Road	PM	.96	E
Culver Drive at University Drive	PM	.91	E
Jeffrey Road at Alton Parkway	AM	1.06	F
Laguna Canyon Road at Old Laguna Canyon Road	AM	1.36	F
	PM	1.03	F
Bake Parkway at Jeronimo Rd	AM	.92	E
Lake Forest Drive at Portola Parkway	AM	.94	E

Exhibit 4-52 Existing Circulation System

Exhibit 4-53 Existing ADT Volumes

Exhibit 4-54 Existing (2000) Intersection Location Map

Freeway Mainline and Ramp Analysis

Analysis of the freeway mainline segments (see Exhibit 4-53 for V/C ratios) reveals that the following seven locations are operating at unacceptable levels of service according to the criteria outlined previously:

Freeway Segment	Lanes	ADT	Capacity	V/C	LOS
I-5 between Tustin Ranch Road and Jamboree Road	12	275,000	252,000	1.09	F
I-5 between Jamboree Road and Culver Drive	12	271,000	252,000	1.08	F
I-5 between Culver Drive and Jeffrey Road	12	257,000	252,000	1.02	F
I-5 between Jeffrey Road and Sand Canyon Avenue	12	255,000	252,000	1.01	F
I-5 between Bake Parkway and Lake Forest Drive	14	340,000	294,000	1.16	F
I-405 between Jeffrey Road and Sand Canyon Avenue	10	237,000	210,000	1.13	F
I-405 between Sand Canyon Avenue and SR-133	10	231,000	210,000	1.10	F

An analysis was conducted for the existing ramp locations illustrated in Exhibit 4-55. The freeway ramp analysis presented in Environmental Impacts, Section 4.14.2 differs from the previous peak hour analysis which included ramp intersections with arterial streets. The analysis here involves the peak hour V/C of the ramp itself as a means to assess any deficiency whereas the previous analysis attributed deficiency by reviewing the ICU value of the ramp intersection with the arterial street. Analysis of the freeway ramps reveals that one location is operating at an unacceptable level of service during PM peak hour conditions. This location is the I-5 southbound off-ramp to Culver Drive (V/C = 1.72).

4.14.2 ENVIRONMENTAL IMPACTS

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on transportation/circulation if it will:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

- Exceed, either individually or cumulatively, a level of service standard established by the County Congestion Management Agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. (Please refer to Section 4.9. "Land Use/Planning," for a discussion of the consistency between the proposed Land Use Plan and the County's adopted Reuse Plan for MCAS El Toro.)

Exhibit 4-55 Existing (2000) Freeway Ramp Location Map

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (No significant impacts were identified in the Initial Study since all roadways will be designed in accordance with adopted City of Irvine roadway standards. As a result, this threshold does not apply.)

- Result in inadequate emergency access. (Please refer to Section 4.7. "Hazards and Hazardous Materials," for a discussion of potential impacts to emergency access.)

- Result in inadequate parking capacity. (No significant impacts were identified in the Initial Study since all future projects will provide parking in accordance with the City's Zoning Code. As a result, this threshold does not apply.)

Land Use and Trip Generation

A land use and trip generation summary for the project is given in Table 4-82. The proposed project is assumed to be partially built by 2007 and built out by 2025. For 2007 conditions, 400 residential units in PA8A and 3,100 residential units and 150,000 square feet of retail in PA9 are assumed. Buildout of the project includes 1,900 residential units in PA5B, 4,500 residential units, 300,000 square feet of retail uses and 2,400,000 square feet of office and research and development (R&D) uses in PA6, 400 residential units in PA8A, and 5,550 residential units, 450,000 square feet of retail and 4,166,000 square feet of office and R&D uses in PA9 for a total development of 12,350 residential units, 750,000 square of retail, and 6,566,000 square feet of office and R&D uses. There are currently agricultural uses in some parts of the project area. It should be noted that retail (commercial) uses are assumed for the purpose of presenting a "worst case" analysis when the zoning designation is multi-use.

As shown on Table 4-82, the buildout of the proposed project generates approximately 254,900 average daily trips (ADT) with eight and nine percent occurring in the AM and PM peak hour, respectively. Approximately 18 percent of the buildout trip generation is assumed to occur by 2007. It should be noted that socioeconomic data is used for areawide analyses while City of Irvine adopted land use trip rates are used for site specific analyses. The project also includes the reduction of General Plan residential units in other planning areas as follows:

NCCP Bank	3,888
Planning Area 2	1,220
Planning Area 5A	955
Planning Area 8	804
Planning Area 11	1,825
Planning Area 12	858
Planning Area 15	2,537
TOTAL	12,087

Table 4-82
Proposed Project Land Use and Trip Generation Summary

LAND USE TYPE	UNITS		---AM PEAK HOUR--- IN	OUT	TOTAL	---PM PEAK HOUR — IN	OUT	TOTAL	ADT
PROPOSED PROJECT - 2007									
101 Single Family Detached	1,343.00	DU	255	739	994	886	470	1,356	12,826
102 Cluster A	882.00	DU	114	450	564	494	212	706	7,056
103 Cluster B	1,275.00	DU	115	536	651	536	255	791	8,250
109 Commercial (EQ)	135.50	TSF	234	216	450	401	417	818	10,493
113 Restaurant	6.50	TSF	51	51	102	57	49	106	1,008
114 Fast Food Restaurant	7.00	TSF	198	191	389	133	123	256	4,425
116 Gas Station	1.00	SITE	44	44	88	61	61	122	1,012
136 Elementary, Middle	900.00	STU	162	108	270	18	45	63	981
TOTAL (using vehicle trip rates below)		1,173	2,335	3,508	2,586	1,632	4,218	46,051	
TOTAL (model-based)			714	1,894	2,608	1,672	1,118	2,790	31,922
PROPOSED PROJECT - Buildout (Post-2020 and 2025)									
101 Single Family Detached	6155.00	DU	1,170	3,387	4,557	4,061	2,156	6,217	58,782
102 Cluster A	4070.00	DU	530	2,077	2,607	2,280	976	3,256	32,560
103 Cluster B	2125.00	DU	191	894	1,085	894	425	1,319	13,750
109 Commercial (EQ)	672.25	TSF	935	863	1,798	1,597	1,662	3,259	41,798
113 Restaurant	32.50	TSF	255	255	510	285	244	529	5,039
114 Fast Food Restaurant	40.25	TSF	1,141	1,096	2,237	766	705	1,471	25,443
116 Gas Station	5.00	SITE	220	220	440	305	305	610	5,060
121 Office (EQ) (Equation base = 300.00 TSF)	2298.10	TSF	1,729	517	2,246	494	1,651	2,145	24,664
125 R&D	4267.90	TSF	3,629	767	4,396	682	3,843	4,525	42,508
136 Elementary, Middle	4600.00	STU	828	552	1,380	92	230	322	5,014
139 Park	51.00	ACRE	4	6	10	12	8	20	255
TOTAL (using vehicle trip rates below)		10,632	10,634	21,266	11,468	12,205	23,673	254,873	
TOTAL (model-based)			7,542	8,526	16,068	8,998	8,653	17,651	200,265
VEHICLE TRIP RATES									
101 Single Family Detached		DU	.19	.55	.74	.66	.35	1.01	9.55
102 Cluster A		DU	.13	.51	.64	.56	.24	.80	8.00
103 Cluster B		DU	.09	.42	.51	.42	.20	.62	6.47
113 Restaurant		TSF	7.85	7.85	15.70	8.78	7.48	16.26	155.00
114 Fast Food Restaurant		TSF	28.34	27.22	55.56	19.00	17.53	36.53	632.12
116 Gas Station		SITE	43.50	43.50	87.00	61.00	61.00	122.00	1,012.00
125 Research and Development		TSF	.85	.18	1.03	.16	.90	1.06	9.96
136 Elementary, Middle		STU	.18	.12	.30	.02	.05	.07	1.09
139 Park		ACRE	0.08	0.12	0.20	0.24	0.16	0.40	5.00

VEHICLE TRIP EQUATION RATES

		Coefficients		AM PEAK HOUR PK/ADT			PM PEAK HOUR PK/ADT		
	UNITS	A	B	RATIO	IN	OUT	RATIO	IN	OUT
Commercial EQ	TSF	.625	5.985	.043	52%	48%	.078	49%	51%
Office (EQ)	TSF	.756	3.765	.091	77%	23%	.087	23%	77%

(EQ) Equation - based trip rate with equation form: LN(T) = A x LN (X) + B where X = Land Use Amount and T = Daily Trips

However, in order to identify the impacts of development in the Northern Sphere Area, the transfer of residential units from these planning areas are included in both the no-project and with-project conditions. In addition, no land uses other than those existing are assumed in Planning Areas 5B, 8A, 6 and 9 for no-project conditions in order to identify the impacts of the development in the Northern Sphere Area.

Project Trip Distribution

The 2007, 2025 (constrained and buildout toll networks) and Post-2040 toll-free trip distributions for the project are shown in Exhibits 4-56 through 4-59. These trip distributions were derived from the ITAM and are based on ADT volumes. Differences in surrounding land uses together with the different regional accessibility afforded by changes in regional transportation facilities, cause slight differences in the project distribution for each time frame. These percentages differ slightly in the peak hours, and the individual peak distributions were used by the traffic model to assign peak hour trips. According to ITAM, the internal capture of project generated traffic is approximately three percent for 2007 conditions in which the project is assumed partially built and approximately 11 percent for 2025 (constrained and buildout toll conditions) and Post-2040 (toll-free conditions) in which the project is assumed built out.

Exhibit 4-56 2007 Project Trip Distribution

Exhibit 4-57 2025 (Constrained) Trip Distribution

Exhibit 4-58 2025 (No Toll) Trip Distribution

Exhibit 4-59 Post-2040 Trip Distribution

2007 Analysis

2007 Circulation System

Over the next five to seven years, improvements are planned for the circulation system within or near the study area. This year 2007 circulation system assumes only those improvements which exist or are committed for construction (i.e., public agency Capital Improvement Programs, state transportation improvement program, etc.) or would be constructed as part of previously entitled development by this time frame. Exhibit 4-60 shows the midblock lanes for the 2007 circulation system. At the regional level, the SR-133 (north of I-5), SR-241 and SR-261 are toll facilities.

2007 Impact Analysis

Exhibits 4-61 and 4-62 show the 2007 average daily traffic (ADT) forecasts and volume/capacity (V/C) ratios for the study area circulation system based on no-project and proposed project land uses. The no-project volumes assume no other land uses except those existing uses such as agricultural on the project site.

Freeway/Tollway Mainline and Ramp Analysis

According to the freeway mainline analysis, there are no freeway mainline segments impacted by the project. Analysis of the freeway ramps reveals two locations (Exhibit 4-63 for ramps analyzed) are impacted by the project: 1) I-5 southbound off-ramp to Culver Drive in both the AM and PM peak hour (V/C = 1.07 and 1.80, respectively) and 2) I-405 southbound off-ramp to Irvine Center Drive in the AM peak hour (V/C = 1.04).

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system. These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), and the Orange County Transportation Authority (OCTA) Measure M program.

Exhibit 4-60 2007 Circulation System

Exhibit 4-61 2007 ADT Volumes

Exhibit 4-62 2007 ADT V/C Ratios

Exhibit 4-63 Freeway Ramp Location Map

The TCA has adopted a Major Thoroughfare and Bridge Fee Program in which new development is required to pay a corridor fee at issuance of building permits. The purpose of the fee program is to assure that new development pays its fair share cost towards construction of the ultimate Corridor improvements. The corridor fee revenue can be used to construct additional improvements to the existing transportation corridor system. Based on current fee rates, the Protocol development would contribute approximately $75,000,000 in new Corridor fees. In addition, project traffic would increase the amount of toll revenue that the TCA obtains from operation of the Corridors. It has been assumed that the impacts identified at the SR-133/Trabuco Road can be funded through this program.

The STIP is a four-year expenditure plan that defines how state transportation funds will be allocated. The source of these funds is primarily from state and federal gas taxes. The STIP funds are used for different projects ranging from road maintenance to new freeway construction. Each County is guaranteed a minimum amount of STIP funds.

Traffic Operations Strategies (TOPS) is a program recently implemented by Caltrans to maximize utilization of the existing freeway and tollway system through performance-based investment strategies. The Caltrans' April 2000 TOPS report defines different implementation strategies within the TOPS program including including implementation of "intelligent infrastructure" improvements such as system-wide adaptive ramp metering, advanced traveler information systems and real-time performance measurement systems, and implementation of physical operational improvements such as the construction of freeway auxiliary lanes (merge lanes provided before and after on-ramps), the modification of ramp/city street access and the addition of short passing lanes and truck climbing lanes.

Orange County has supplemented their transportation programs by implementing a county sales tax for transportation improvements through the Measure M program. Funds from this program are available for improvements to regional interchanges and arterial highways. The ramps on the I-5 and I-405 identified as impacted would be eligible for improvement funding through the Measure M program.

It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of the above discussed programs. For example, Caltrans is currently preparing a Project Study Report for the widening of the I-5 southbound off-ramp at Culver Drive to two lanes. If implemented, the improvement will address the project deficiency at this location.

2025 (Constrained) Analysis

This analysis describes traffic conditions for buildout of the project and surrounding land uses in a 2025 time frame with toll conditions on the Eastern and Foothill Transportation Corridors. Traffic volumes and capacity evaluation results for two separate 2025 circulation system conditions under

project buildout conditions are presented and with and without project conditions for the two circulation system assumptions are summarized to identify project mitigation requirements. The two 2025 model networks developed are as follows: 1) a circulation system which assumes only those improvements which exist or are committed for construction or would be constructed as part of previously entitled development by this time frame (referred to as "constrained"); and, 2) buildout of the circulation system in accordance with the City of Irvine's General Plan and County of Orange Master Plan of Arterial Highways (MPAH) (referred to as "2025 buildout").

2025 (Constrained) Circulation System

Exhibit 4-64 presents the year 2025 "constrained" conditions. This year 2025 circulation system assumes only those improvements which exist or are committed for construction (i.e., public agency Capital Improvement Programs, state transportation improvement program, etc.) or would be constructed as part of previously entitled development by this time frame. Toll conditions are assumed on the SR-133 (north of I-5), SR-241 and SR-261.

2025 (Constrained) Traffic Impacts

Exhibits 4-65 and 4-66 show the 2025 average daily traffic (ADT) forecasts and volume/capacity (V/C) ratios for the study area circulation system based on no-project and proposed project land uses under the constrained network. The project impacts for 39 roadway link locations are summarized in Table 4-83. The City of Irvine's Link Capacity Analysis guidelines require that these locations be further examined using peak hour data. The results of the peak hour tests are summarized in Table 4-84. As can be seen in this table, there are no link locations requiring roadway midblock mitigation under the ADT link volume impact criteria. It should be noted that the peak hour link V/C ratios are based on the highest upstream/downstream peak hour volume data obtained from the intersections comprising that link.

Exhibit 4-64 2025 (Constrained) Circulation System

Exhibit 4-65 2025 (Constrained) ADT Volumes

Exhibit 4-66 2025 (Constrained) ADT V/C Ratios

Table 4-83
ADT Roadway Link Deficiency Analysis
(2025 Constrained)

Roadway Segment	No-Project V/C	No-Project LOS	With-Project V/C	With-Project LOS
Alton w/o Jeffrey	1.16	F	1.22	F
Alton s/o Commercentre	1.28	F	1.30	F
Bake n/o Commercentre	1.09	F	1.12	F
Bake n/o Trabuco	1.36	F	1.39	F
Bake n/o Toledo	.94	E	.96	E
Barranca w/o Jeffrey	1.03	F	1.09	F
Culver s/o I-5 SB Ramps	.96	E	1.00	E
El Camino Real e/o Jamboree	.94	E	.97	E
Irvine e/o Yale	.75	C	1.03	F
Irvine w/o Jeffrey	.83	D	1.05	F
Irvine w/o Research	.78	C	.94	E
Irvine e/o Research	.78	C	.91	E
Irvine e/o Alton	.94	E	1.04	F
Jamboree n/o I-5 NB Ramps	.93	E	.95	E
Jeffrey n/o I-5 NB Ramps	.81	D	1.06	F
Jeffrey s/o Walnut	.85	D	1.00	E
Jeffrey n/o Barranca	.87	D	1.00	E
Jeffrey n/o Alton	.93	E	1.02	F
Jeffrey s/o Alton	1.00	E	1.07	F
Millennium n/o Barranca	1.06	F	1.13	F
Millennium s/o Alton	.89	D	.94	E
Portola w/o Culver	.85	D	.94	E
Portola e/o Sand Canyon	.47	A	.97	E
Portola w/o Research	.47	A	1.00	E
Portola e/o Millennium	.38	A	.97	E
Rancho w/o Bake	.88	D	.91	E
Rockfield e/o Bake	.97	E	1.00	E
Sand Canyon n/o Irvine	.34	A	1.13	F
Sand Canyon s/o Trabuco	.70	B	1.20	F
Sand Canyon s/o Roosevelt	.80	C	1.13	F

Table 4-83
ADT Roadway Link Deficiency Analysis
(2025 Constrained)

Roadway Segment	No-Project V/C	No-Project LOS	With-Project V/C	With-Project LOS
Sand Canyon n/o I-5 NB Ramps	.98	E	1.30	F
Sand Canyon s/o I-5 SB Ramps	1.06	F	1.20	F
Trabuco e/o Jeffrey	.81	D	.91	E
Trabuco e/o Rd "A"	.78	C	.91	E
Trabuco w/o Sand Canyon	.81	D	.91	E
Trabuco e/o Sand Canyon	.81	D	.91	E
Trabuco w/o Research	1.28	F	1.33	F
Trabuco e/o Research	1.02	F	1.06	F
Walnut w/o Culver	.88	D	.91	E

Table 4-84
Peak Hour Link Capacity Analysis
(2025 Constrained)

Roadway Segment	Lanes	ADT	Peak Hour Capacity	Highest Peak Volume	V/C	LOS
Alton w/o Jeffrey	4	39,000	3,200	2,350 (PM Westbound)	.73	C
Alton s/o Commercentre	6	70,000	4,800	3,220 (AM Northbound)	.67	B
Bake n/o Commercentre	4	42,000	3,200	2,130 (AM Southbound)	.67	B
Bake n/o Trabuco	4	52,000	3,200	2,342 (PM Northbound)	.73	C
Bake n/o Toledo	6	52,000	4,800	2,350 (AM Southbound)	.49	A
Barranca w/o Jeffrey	4	35,000	3,200	1,964 (AM Eastbound)	.61	B
Culver s/o I-5 SB Ramps	6	54,000	4,800	2,904 (PM Northbound)	.61	B
El Camino Real e/o Jamboree	4	31,000	3,200	2,237 (PM Eastbound)	.70	B
Irvine e/o Yale	5	41,000	3,200	2,369 (AM Eastbound)	.74	C
Irvine w/o Jeffrey	5	42,000	3,200	2,369 (AM Eastbound)	.74	C
Irvine w/o Research	6	51,000	4,800	4,039 (AM Eastbound)	.84	D
Irvine e/o Research	6	49,000	4,800	2,970 (AM Eastbound)	.62	B
Irvine e/o Alton	6	56,000	4,800	3,190 (AM Westbound)	.66	B
Jamboree n/o I-5 NB Ramps	8	71,000	6,400	4,180 (PM Northbound)	.65	B
Jeffrey n/o I-5 NB Ramps	7	67,000	4,800	3,190 (PM Northbound)	.66	B
Jeffrey s/o Walnut	6	54,000	4,800	2,927 (AM Southbound)	.61	B
Jeffrey n/o Barranca	6	54,000	4,800	2,517 (PM Northbound)	.52	A
Jeffrey n/o Alton	6	55,000	4,800	2,301 (PM Northbound)	.48	A
Jeffrey s/o Alton	6	58,000	4,800	3,076 (PM Northbound)	.64	B
Millennium n/o Barranca	6	61,000	4,800	2,930 (PM Southbound)	.61	B
Millennium s/o Alton	6	51,000	4,800	2,793 (PM Southbound)	.58	A
Portola w/o Culver	6	51,000	4,800	2,660 (AM Eastbound)	.55	A
Portola e/o Sand Canyon	4	31,000	3,200	1,708 (PM Eastbound)	.53	A
Portola w/o Research	4	32,000	3,200	1,708 (PM Eastbound)	.53	A
Portola e/o Millennium	4	31,000	3,200	1,880 (PM Northbound)	.59	A
Rancho w/o Bake	4	34,000	3,200	1,530 (AM Westbound)	.48	A
Rockfield e/o Bake	4	32,000	3,200	1,635 (PM Eastbound)	.51	A
Sand Canyon n/o Irvine	4	36,000	3,200	1,661 (PM Northbound)	.52	A
Sand Canyon s/o Trabuco	6	65,000	4,800	3,079 (AM Southbound)	.64	B
Sand Canyon s/o Roosevelt	6	61,000	4,800	2,560 (PM Northbound)	.53	A
Sand Canyon n/o I-5 NB Ramps	6	70,000	4,800	3,008 (PM Southbound)	.63	B
Sand Canyon s/o I-5 SB Ramps	6	65,000	4,800	2,751 (AM Southbound)	.57	A
Trabuco e/o Jeffrey	4	29,000	3,200	2,167 (AM Eastbound)	.68	B
Trabuco e/o Rd "A"	4	29,000	3,200	1,708 (AM Eastbound)	.53	A
Trabuco w/o Sand Canyon	4	29,000	3,200	1,840 (PM Westbound)	.58	A
Trabuco e/o Sand Canyon	6	49,000	4,800	2,481 (PM Eastbound)	.52	A
Trabuco w/o Research	6	72,000	4,800	4,180 (AM Eastbound)	.87	D
Trabuco e/o Research	6	57,000	4,800	3,131 (AM Eastbound)	.65	B
Walnut w/o Culver	4	29,000	3,200	1,541 (AM Eastbound)	.48	A

Freeway/Tollway Mainline and Ramp Analysis

According to the freeway/tollway mainline analysis, there are no freeway/tollway mainline segments impacted by the project. However, the following seven ramp locations (see Exhibit 4-67 for ramps analyzed) are impacted by the project.

		No-Project		With-Project	
Ramp Location	**Peak Hour**	**V/C**	**LOS**	**V/C**	**LOS**
I-5 southbound on-ramp at Jeffrey Road	AM	.99	E	1.05	F
I-5 northbound on-ramp at Sand Canyon Avenue	PM	1.72	F	1.80	F
I-5 southbound off-ramp at Sand Canyon Avenue	AM	1.46	F	1.64	F
I-5 southbound off-ramp at Alton Parkway	AM	1.20	F	1.27	F
I-405 northbound direct on-ramp at Sand Canyon Avenue	PM	1.32	F	1.40	F
I-405 southbound off-ramp at Sand Canyon Avenue	AM	1.18	F	1.27	F
SR-133 northbound off-ramp at Trabuco Road	AM	1.14	F	1.30	F

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system. These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), and the Orange County Transportation Authority (OCTA) Measure M program. It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of these programs.

Exhibit 4-67 2025 (Constrained) Freeway Ramp Location Map

Buildout (2025 and Post-2040) Circulation System

For the 2025 buildout scenario and Post-2040 circulation system conditions, full buildout of the Cities of Irvine, Tustin, Orange, Lake Forest General Plan Circulation Elements and County of Orange Master Plan of Arterial Highways (MPAH) are assumed. This buildout roadway network is illustrated in Exhibit 4-68, and the facility type designations are shown in Exhibit 4-69. These facility types are based on the Cities of Irvine, Tustin, Orange, Lake Forest General Plan Circulation Elements and correspond to the County MPAH. At the regional level, the FTC/SR-241 and ETC/SR-261 are assumed free facilities under Post-2040 conditions and toll under year 2025 conditions.

2025 (Buildout Toll) Analysis

2025 (Buildout Toll) Impact Analysis

Exhibits 4-70 and 4-71 show the 2025 ADT forecasts and V/C ratios for the study area circulation system based on no-project and proposed project land uses under the buildout network. As shown in Table 4-85, the project impacts 40 roadway locations. The City of Irvine's Link Capacity Analysis guidelines require that these locations be further examined using peak hour data. The results of the peak hour tests are summarized in Table 4-86, and as can be seen in this table, there are no link locations requiring roadway midblock mitigation under the ADT link volume impact criteria. It should be noted that the peak hour link V/C ratios are based on the highest upstream/downstream peak hour volume data obtained from the intersections comprising that link.

Exhibit 4-68 Buildout Circulation System - 2025 Toll & 2040 Toll-Free

Exhibit 4-69 Adopted General Plan Circulation

Exhibit 4-70 2025 (Buildout) ADT Volumes

Exhibit 4-71 2025 (Buildout) ADT V/C Ratios

Table 4-85
Adt Roadway Link Deficiency Analysis
(2025 Buildout Toll)

Roadway Segment	No-Project V/C	No-Project LOS	With-Project V/C	With-Project LOS
Alton e/o Culver	1.00	E	1.03	F
Alton w/o Jeffrey	1.13	F	1.16	F
Alton n/o Commercentre	1.03	F	1.07	F
Alton s/o Commercentre	1.11	F	1.13	F
Bake n/o Trabuco	1.33	F	1.36	F
Bake n/o Jeronimo	1.02	F	1.04	F
Barranca e/o Culver	1.06	F	1.09	F
Barranca w/o Jeffrey	1.00	F	1.06	F
Culver s/o I-5 SB Ramps	.98	E	1.02	F
Culver s/o ICD	.96	E	.98	E
El Camino Real e/o Jamboree	.94	E	.97	E
Irvine e/o Jeffrey	.65	B	.96	E
Irvine w/o Research	1.17	F	1.24	F
Irvine e/o Alton	.91	E	.96	E
Jeffrey s/o Irvine	.61	B	.93	E
Jeffrey n/o Trabuco	.67	B	.94	E
Jeffrey s/o Trabuco	.65	B	.94	E
Jeffrey n/o I-5 NB Ramps	.87	D	1.10	F
Jeffrey s/o Walnut	.91	E	1.04	F
Jeffrey n/o Barranca	.93	E	1.02	F
Jeffrey n/o Alton	.94	E	1.02	F
Jeffrey s/o Alton	.96	E	1.02	F
Millennium n/o Barranca	1.02	F	1.09	F
Portola s/o SR-241 SB Ramps	.81	D	.91	E
Portola e/o Jeffrey	.72	C	.91	E
Portola e/o Sand Canyon	.78	C	1.19	F
Portola w/o Research	.78	C	1.22	F
Portola w/o Millennium	.84	D	1.09	F
Portola e/o Millennium	.81	D	1.31	F
Research s/o Portola	.68	B	.93	E
Rockfield e/o Bake	.94	E	.97	E
Sand Canyon n/o Irvine	.59	A	1.25	F
Sand Canyon s/o Trabuco	.76	C	1.19	F
Sand Canyon n/o I-5 NB Ramps	1.04	F	1.30	F
Sand Canyon s/o I-5 SB Ramps	1.07	F	1.20	F
Sand Canyon s/o Roosevelt	.83	D	1.11	F
Trabuco e/o Jeffrey	.78	C	.91	E
Trabuco w/o Research	1.17	F	1.24	F
Trabuco e/o Research	.91	E	.96	E
Walnut w/o Culver	.88	D	.91	E

Table 4-86
Peak Hour Link Capacity Analysis
(2025 Buildout)

Roadway Segment	Lanes	ADT	Peak Hour Capacity	Highest Peak Volume	V/C	LOS
Alton e/o Culver	4	33,000	3,200	1,859 (PM Eastbound)	.58	A
Alton w/o Jeffrey	4	37,000	3,200	2,350 (PM Westbound)	.73	C
Alton n/o Commercentre	6	60,000	4,800	2,785 (PM Northbound)	.58	A
Alton s/o Commercentre	6	61,000	4,800	2,920 (AM Northbound)	.61	B
Bake n/o Trabuco	4	51,000	3,200	2,320 (AM Southbound)	.73	C
Bake n/o Jeronimo	6	56,000	4,800	2,632 (PM Southbound)	.55	A
Barranca e/o Culver	4	35,000	3,200	1,998 (PM Westbound)	.62	B
Barranca w/o Jeffrey	4	34,000	3,200	1,845 (AM Eastbound)	.58	A
Culver s/o I-5 SB Ramps	6	55,000	4,800	2,937 (PM Southbound)	.61	B
Culver s/o ICD	6	53,000	4,800	2,973 (PM Northbound)	.62	B
El Camino Real e/o Jamboree	4	31,000	3,200	2,020 (PM Eastbound)	.63	B
Irvine e/o Jeffrey	6	52,000	4,800	3,806 (AM Eastbound)	.79	C
Irvine w/o Research	6	51,000	4,800	3,950 (AM Eastbound)	.82	D
Irvine e/o Alton	6	55,000	4,800	3,160 (AM Westbound)	.66	B
Jeffrey s/o Irvine	6	50,000	4,800	2,412 (AM Southbound)	.50	A
Jeffrey n/o Trabuco	6	51,000	4,800	3,180 (AM Southbound)	.66	B
Jeffrey s/o Trabuco	7	59,000	4,800	3,250 (PM Northbound)	.68	B
Jeffrey n/o I-5 NB Ramps	7	69,000	4,800	3,210 (PM Northbound)	.67	B
Jeffrey s/o Walnut	6	56,000	4,800	3,011 (AM Southbound)	.63	B
Jeffrey n/o Barranca	6	55,000	4,800	2,566 (PM Northbound)	.53	A
Jeffrey n/o Alton	6	55,000	4,800	2,267 (PM Northbound)	.47	A
Jeffrey s/o Alton	6	55,000	4,800	2,965 (PM Northbound)	.62	B
Millennium n/o Barranca	6	59,000	4,800	2,848 (PM Southbound)	.59	A
Portola s/o SR-241 SB Ramps	4	29,000	3,200	2,330 (PM Eastbound)	.73	C
Portola e/o Jeffrey	4	29,000	3,200	2,430 (AM Eastbound)	.76	C
Portola e/o Sand Canyon	4	38,000	3,200	1,878 (PM Eastbound)	.59	A
Portola w/o Research	4	39,000	3,200	1,878 (PM Eastbound)	.59	A
Portola w/o Millennium	4	35,000	3,200	2,157 (PM Eastbound)	.67	B
Portola e/o Millennium	4	42,000	3,200	2,330 (PM Northbound)	.73	C
Research s/o Portola	4	26,000	3,200	1,330 (AM Northbound)	.42	A
Rockfield e/o Bake	4	31,000	3,200	1,642 (PM Eastbound)	.51	A
Sand Canyon n/o Irvine	4	40,000	3,200	1,690 (PM Northbound)	.53	A
Sand Canyon s/o Trabuco	6	64,000	4,800	2,990 (AM Southbound)	.62	B
Sand Canyon n/o I-5 NB Ram	6	70,000	4,800	3,003 (AM Northbound)	.63	B
Sand Canyon s/o I-5 SB Ram	6	65,000	4,800	2,765 (AM Southbound)	.58	A
Sand Canyon s/o Roosevelt	6	60,000	4,800	2,546 (PM Northbound)	.53	A
Trabuco e/o Jeffrey	4	29,000	3,200	2,311 (AM Eastbound)	.72	C
Trabuco w/o Research	6	67,000	4,800	4,110 (AM Eastbound)	.86	D
Trabuco e/o Research	6	52,000	4,800	2,980 (AM Eastbound)	.62	B
Walnut w/o Culver	4	29,000	3,200	1,519 (AM Eastbound)	.47	A

FreewayTollway Mainline and Ramp Analysis

According to the freeway mainline analysis, there are no freeway mainline segments impacted by the project. However, the following eight ramp locations (see Exhibit 4-72 for ramps analyzed) are impacted by the project.

		No-Project		With-Project	
Ramp Location	**Peak Hour**	**V/C**	**LOS**	**V/C**	**LOS**
I-5 southbound off-ramp at Culver Drive	PM	1.53	F	1.72	F
I-5 southbound on-ramp at Jeffrey Road	AM	.96	E	1.06	F
I-5 northbound on-ramp at Sand Canyon Avenue	PM	1.56	F	1.72	F
I-5 southbound off-ramp at Sand Canyon Avenue	AM	1.46	F	1.66	F
I-5 southbound off-ramp at Alton Parkway	AM	1.19	F	1.24	F
I-5 southbound off-ramp at Bake Parkway	AM	1.05	F	1.10	F
I-405 southbound off-ramp at Sand Canyon Avenue	AM	1.27	F	1.31	F
SR-133 northbound off-ramp at Trabuco Road	AM	1.07	F	1.25	F

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system.

These include TCA Corridor program, the STIP, Caltrans TOPS, and the OCTA Measure M program. It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of these programs. Please refer to the 2007 Analysis for a complete discussion of these programs.

Post-2040 Analysis

This chapter describes traffic conditions for buildout of the project and surrounding land uses in a Post-2040 time frame with toll-free conditions on the Eastern and Foothill Transportation Corridors. Traffic volumes and capacity evaluation results for Post-2040 circulation system conditions under project buildout conditions are presented and with and without project conditions are summarized to identify project mitigation requirements. Buildout of the circulation system is assumed in accordance with the City of Irvine's General Plan and County of Orange Master Plan of Arterial Highways (MPAH).

Exhibit 4-72 2025 (Buildout) Freeway Ramp Location Map

Post-2040 Impact Analysis

Exhibits 4-73 and 4-74 show the Post-2040 average daily traffic (ADT) forecasts and volume/capacity (V/C) ratios for the study area circulation system based on no-project and proposed project land uses. As shown on Table 4-87, the project potentially impacts 38 roadway locations.

The City of Irvine's Link Capacity Analysis guidelines require that these locations be further examined using peak hour data. The results of the peak hour tests are summarized in Table 4-88. As can be seen in this table, there are no link locations requiring roadway midblock mitigation under the ADT link volume impact criteria. It should be noted that the peak hour link V/C ratios are based on the highest upstream/downstream peak hour volume data obtained from the intersections comprising that link.

Freeway Mainline and Ramp Analysis

According to the freeway/tollway mainline analysis, there are no freeway/tollway mainline segments impacted by the project. However, the following seven ramp locations (see Exhibit 4-75 for ramps analyzed) are impacted by the project.

		No-Project		With-Project	
Ramp Location	**Peak Hour**	**V/C**	**LOS**	**V/C**	**LOS**
I-5 southbound on-ramp at Jeffrey Road	AM	.96	E	1.03	F
I-5 northbound on-ramp at Sand Canyon Avenue	PM	1.72	F	1.98	F
I-5 southbound off-ramp at Sand Canyon Avenue	AM	1.66	F	1.84	F
I-5 southbound off-ramp at Alton Parkway	AM	1.35	F	1.40	F
I-405 northbound direct on-ramp at Sand Canyon Avenue	PM	.95	E	1.01	F
I-405 southbound off-ramp at Sand Canyon Avenue	AM	1.32	F	1.39	F
SR-133 northbound off-ramp at Trabuco Road	AM	.93	E	1.10	F

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system.

Exhibit 4-73 Post-2040 (Toll-Free) ADT Volumes

Exhibit 4-74 Post-2040 (Toll-Free) ADT V/C Ratios

Table 4-87
ADT Roadway Link Deficiency Analysis
(Post-2040)

Roadway Segment	No-Project ADT V/C	No-Project ADT LOS	With-Project ADT V/C	With-Project ADT LOS
Alton n/o Commercentre	.89	D	.92	E
Alton s/o Commercentre	.93	E	.96	E
Alton e/o Culver	.94	E	.97	E
Alton w/o Jeffrey	1.09	F	1.13	F
Bake n/o Toledo	.91	E	.93	E
Barranca e/o Culver	1.03	F	1.06	F
Barranca w/o Jeffrey	1.03	F	1.06	F
Culver s/o I-5 SB Ramps	.98	E	1.02	F
Culver s/o ICD	.94	E	.96	E
Culver s/o Barranca	.91	E	.93	E
El Camino Real e/o Jamboree	.88	D	.91	E
ICD e/o Jeffrey	.89	D	.91	E
Irvine w/o Research	.76	C	.94	E
Irvine e/o Alton	.89	D	.96	E
Jeffrey n/o Trabuco	.63	B	.91	E
Jeffrey s/o Trabuco	.63	B	.92	E
Jeffrey n/o I-5 NB Ramps	.87	D	1.10	F
Jeffrey s/o Walnut	.94	E	1.07	F
Jeffrey n/o Barranca	.94	E	1.06	F
Jeffrey n/o Alton	.98	E	1.06	F
Jeffrey s/o Alton	1.02	F	1.07	F
Millennium n/o Barranca	1.04	F	1.11	F
Millennium s/o Alton	.89	D	.93	E
Portola e/o Sand Canyon	.50	A	.94	E
Portola w/o Research	.50	A	1.00	E
Portola e/o Millennium	.63	B	1.09	F
Rockfield e/o Bake	.97	E	1.00	E
Sand Canyon n/o Irvine	.41	A	1.09	F
Sand Canyon s/o Trabuco	.80	C	1.26	F
Sand Canyon s/o Roosevelt	.87	D	1.19	F
Sand Canyon n/o I-5 NB Ramps	1.06	F	1.37	F
Sand Canyon s/o I-5 SB Ramps	1.24	F	1.41	F
Sand Canyon n/o ICD	.85	D	.96	E
Sand Canyon n/o Barranca	.87	D	.94	E
Sand Canyon n/o I-405 NB Ramps	.91	E	.96	E
Technology e/o Barranca	1.00	E	1.03	F
Trabuco w/o Research	1.13	F	1.19	F
Walnut w/o Culver	.88	D	.91	E

Table 4-88
Peak Hour Link Capacity Analysis
(Post-2040)

Roadway Segment	Lanes	ADT	Peak Hour Capacity	Highest Peak Volume	V/C	LOS
Alton n/o Commercentre	6	52,000	4,800	2,660 (PM Northbound)	.55	A
Alton s/o Commercentre	6	52,000	4,800	2,680 (PM Southbound)	.56	A
Alton e/o Culver	4	31,000	3,200	1,750 (PM Eastbound)	.55	A
Alton w/o Jeffrey	4	36,000	3,200	2,292 (PM Westbound)	.72	C
Bake n/o Toledo	6	50,000	4,800	2,350 (AM Southbound)	.49	A
Barranca e/o Culver	4	34,000	3,200	1,988 (PM Westbound)	.62	B
Barranca w/o Jeffrey	4	34,000	3,200	1,904 (AM Eastbound)	.60	A
Culver s/o I-5 SB Ramps	6	55,000	4,800	3,000 (AM Southbound)	.63	B
Culver s/o ICD	6	52,000	4,800	2,935 (PM Northbound)	.61	B
Culver s/o Barranca	6	50,000	4,800	2,380 (PM Northbound)	.50	A
El Camino Real e/o Jamboree	4	29,000	3,200	2,020 (PM Eastbound)	.63	B
ICD e/o Jeffrey	6	49,000	4,800	3,140 (AM Eastbound)	.65	B
Irvine w/o Research	6	51,000	4,800	3,977 (AM Eastbound)	.83	D
Irvine e/o Alton	6	52,000	4,800	3,110 (AM Westbound)	.65	B
Jeffrey n/o Trabuco	6	49,000	4,800	3,270 (AM Southbound)	.68	B
Jeffrey s/o Trabuco	7	58,000	4,800	3,382 (PM Northbound)	.70	B
Jeffrey n/o I-5 NB Ramps	7	69,000	4,800	3,360 (PM Northbound)	.70	B
Jeffrey s/o Walnut	6	58,000	4,800	3,135 (AM Southbound)	.65	B
Jeffrey n/o Barranca	6	57,000	4,800	2,680 (AM Southbound)	.56	A
Jeffrey n/o Alton	6	57,000	4,800	2,427 (PM Northbound)	.51	A
Jeffrey s/o Alton	6	58,000	4,800	3,213 (PM Northbound)	.67	B
Millennium n/o Barranca	6	60,000	4,800	2,873 (PM Southbound)	.60	A
Millennium s/o Alton	6	50,000	4,800	2,841 (PM Southbound)	.59	A
Portola e/o Sand Canyon	4	30,000	3,200	1,768 (PM Eastbound)	.55	A
Portola w/o Research	4	32,000	3,200	1,768 (PM Eastbound)	.55	A
Portola e/o Millennium	4	35,000	3,200	2,200 (PM Northbound)	.69	B
Rockfield e/o Bake	4	32,000	3,200	1,569 (PM Westbound)	.49	A
Sand Canyon n/o Irvine	4	35,000	3,200	1,721 (PM Northbound)	.54	A
Sand Canyon s/o Trabuco	6	68,000	4,800	3,114 (AM Southbound)	.65	B
Sand Canyon s/o Roosevelt	6	64,000	4,800	2,726 (PM Northbound)	.57	A
Sand Canyon n/o I-5 NB Ramps	6	74,000	4,800	3,201 (PM Northbound)	.67	B
Sand Canyon s/o I-5 SB Ramps	6	76,000	4,800	3,169 (AM Southbound)	.66	B
Sand Canyon n/o ICD	6	52,000	4,800	2,250 (AM Southbound)	.47	A
Sand Canyon n/o Barranca	6	51,000	4,800	2,279 (AM Southbound)	.47	A
Sand Canyon n/o I-405 NB Ramps	6	52,000	4,800	3,256 (AM Northbound)	.68	B
Technology e/o Barranca	4	33,000	3,200	1,881 (PM Eastbound)	.59	A
Trabuco w/o Research	6	64,000	4,800	3,836 (AM Eastbound)	.80	C
Walnut w/o Culver	4	29,000	3,200	1,479 (AM Eastbound)	.46	A

Exhibit 4-75 Post-2040 (Toll-Free) Freeway Ramp Location Map

These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), and the Orange County Transportation Authority (OCTA) Measure M program. It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of these programs. Please refer to the 2007 Analysis for a complete discussion of these programs.

Project Impacts

Project impacts are identified based on comparison of with and without project conditions. Road and intersection volumes were compared for without and with project land uses. A significant project impact that would require mitigation occurs when a location does not meet the Level of Service (LOS) criteria (LOS "E" in City of Irvine's PA33 and PA36, LOS "D" elsewhere), and when the project either causes the deficiency or increases the deficiency by .02 or more. Certain intersections defined in the Congestion Management Program (CMP) are evaluated based on the CMP guidelines where the acceptable criteria is LOS "E" or if contribution to an already deficient location is not greater than .03).

The impact analysis sections of this report showed that there are no roadway link locations adversely impacted by the project according to the City of Irvine's Link Capacity Analysis guidelines which require roadway links exceeding LOS "D" (V/C ratio of .90) or LOS "E" (V/C ratio of 1.00) in PA33 or PA36 be further examined using peak hour data. If the roadway link peak hour data meets the basic performance criteria then the roadway capacity is deemed to meet City of Irvine Standards.

However, several intersections, as summarized in Table 4-89 show significant increases in intersection capacity utilization (ICU) value. As seen in Table 4-89 the proposed project adversely impacts three intersection locations for 2007, 31 intersections for 2025 with constrained network, 23 intersections for 2025 with buildout circulation system and 23 intersections for Post-2040. Mitigation measures have been identified to address the project impacts at these locations, as shown in Table 4-90, and all intersections will continue to operate at acceptable levels of service with mitigation.

Table 4-89 Summary of Impacted Intersections and Mitigation Results (Page 1)

Table 4-89 Summary of Impacted Intersections and Mitigation Results (Page 2)

Table 4-89 Summary of Impacted Intersections and Mitigation Results (Page 3)

Table 4-89 Summary of Impacted Intersections and Mitigation Results (Page 4)

Table 4-89 Summary of Impacted Intersections and Mitigation Results (Page 5)

Table 4-90
Mitigation Lanes for Impacted Intersections

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
34. Red Hill at Irvine	25C,25B,BO	1	2	0	1	3	0	2	1	1	1	3	0
	Mit.						d						
	Alt. Mit.	ATMS (City of Tustin)											
91. Tustin Ranch at Irvine	25C	1	3	f	2	2	1	1	3	1	2	3	1
	25B,BO					3							
	Mit.							2					
	Alt. Mit.	ATMS (City of Tustin)											
125. Jamboree at Irvine	25B	2	3	f	2	3	d	2	3	1	2	3	1
	Mit.	ATMS (City of Tustin)			(mit. not needed at BO)								
127. Jamboree at El Camino Real	07,25C	1	4	d	2	2	0	2	4	1	1	1	2
	Mit.	ATMS (City of Tustin)			(mit. not needed at 25B or BO)								
133. Jamboree at Edinger	07	2	0	1	2	3	1	2	0	f	2	3	1
	Mit.	ATMS (City of Tustin)			(mit. not needed at 25C,25B or BO)								
223. Culver at I-5 SB Ramps	25C	0	3	f	0	0	0	0	3	f	1.5	0	1.5
	25B,BO										2		2
	Mit.								4				
	Alt. Mit.										3		2
224. Culver at Walnut	25C,25B,BO	2	3	d	2	2	d	2	3	1	2	2	0
	Mit.					3							d
	Alt. Mit.	ATMS &											d
235. Culver at University	25C	1	3	0	2	3	d	1	3	d	2	3	0
	Mit.	(mit. not needed at 25B or BO)							2	2			
249. Yale at Irvine Bl	25C,25B,BO	2	2	d	1	3	d	1	2	d	1	3	d
	Mit.							2					
282. Jeffrey at Portola	25C	0	1	1	2	3	0	1	1	f	1	2	1
	Mit.	(mit. not needed at 25B or BO)										3	0
283. Jeffrey at Irvine	25C	2	3	1	2	2	1	2	3	1	1	2	1
	Mit.	(mit. not needed at 25B or BO)										3	
284. Jeffrey at Bryan	25C,25B,BO	1	3	1	1	1	0	2	3	d	1.5	.5	d
	Mit.										1		1.5
285. Jeffrey at Trabuco	25C,25B,BO	1	3	d	1	2	0	2	3	1	1	2	1
	Mit.	2	4		2		d				2		

Table 4-90
Mitigation Lanes for Impacted Intersections

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
301. Sand Cyn at Irvine	25C,25B,BO	2	3	1	2	3	1	2	3	1	2	3	1
	Mit.											4	
302. Sand Cyn at Trabuco	25C,25B,BO	2	3	d	2	2	0	2	3	1	2	2	1
	Mit.				3	3						3	
303. Sand Cyn at I-5 NB Ramps	25C	1	2	1	1	1	0	2	2	0	1.5	.5	1
	25C Mit.			f					3				
	25B,BO	0	3						3		2	1	
	25B,BO Mit.			f									
304. Sand Cyn at Marine	25C	2	2	0	1	0	1	0	2	1	0	0	0
	25C Mit.								3				
	25B,BO		3		2				3	2			
	25B,BO Mit.								4				
305. Sand Cyn at I-5 SB Ramps	25C	2	2	0	0	0	0	0	2	d	1.5	0	1.5
	25C Mit.								3		2.5		
	25B,BO		3						3				
	25B,BO Mit.										2.5		
306. Sand Cyn at Oak Cyn.	BO	1	3	d	2	1	1	1	3	1	2	1	d
	Mit.	2				.5	1.5						
311. Sand Cyn at I-405 NB Ramps	25C,25B,BO	0	2	f	.5	0	1.5	0	2	f	0	0	0
	Mit.				1		2						
316. SR-133 SB Ramps at Irvine	BO	1.5	0	1.5	1	3	0	0	0	0	0	3	d
	Mit.											4	
317. SR-133 NB Ramps at Irvine	25C	0	0	0	0	3	0	1	0	2	0	3	f
	Mit.							1.5		2.5			
	Alt. Mit.	ATMS (mit. or alt. mit. not needed at 25B or BO)											
321. LCR at Old LCR	25B	0	3	1	0	0	0	2	3	0	3	0	f
	Mit.	(mit. not needed at BO)					3						
362. Bake at Irvine	25C	2	3	1	2	3	1	1	3	1	2	3	1
	Mit.	(mit. not needed at 25B or BO)						2		d			
364. Bake at Jeronimo	25C	1	3	d	1	2	0	1	3	d	2	2	1
	Mit.*				2								
	Alt. Mit.	ATMS (mit. or alt. mit. not needed at 25B or BO)											
366. Bake at Rockfield	25C	2	4	1	2	2	f	2	4	f	1	2	f

Table 4-90
Mitigation Lanes for Impacted Intersections

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
406. LCR at Lake Forest	25B	2	3	0	1	0	f	0	3	1	0	0	0
	Mit.				2		(mit. not needed at BO)						
452. Jamboree at Santiago Cyn	BO	2	3	d	2	3	d	2	2	1	2	2.5	1.5
	Mit.		4										
484. Sand Cyn at Roosevelt	25C,25B,BO	1	3	0	1	1	0	1	3	0	1	1	0
	Mit.			d			d			d			d
485. Sand Cyn at Road "B"	07,25C,25B,BO	1	3	0	1	1	0	1	3	0	1	1	0
	Mit.			d	2		d	2					1
490. Research at Trabuco	25C,BO	1	1	f	1	3	1	1	1	1	2	3	1
	Mit.	(mit. not needed at 25B)					2						
507. Bake at Millennium	25C,25B,BO	1	4	f	2	2	0	2	4	1	2	1	f
	25C Mit.		5	0									
	25B,BO Mit.					3	d					2	
512. Irvine at Trabuco	25C	2	3	f	2	3	f	2	3	d	2	3	f
	Mit.		4		(mit. not needed at 25B or BO)								
515a. Bake at Rancho North	25C,25B,BO	1	2	0	2	0	2	0	2	d	0	0	0
	Mit.				2.5		1.5						
515b. Bake at Rancho South	25B	0	2	1	0	0	0	1	2	0	2	0	1
	Mit.			f	(mit not needed at BO)								

* Due to right-of-way constraints, the need for mitigation at this intersection will be re-evaluated in future studies to determine if an alternative mitigation is acceptable.

Abbreviations (in alphabetical order):

Alt. Mit.	Alternative mitigation (for locations within the City of Irvine improvements are subject to approval by the City)
07	2007 Conditions
25B	2025 Buildout Toll Conditions
25C	2025 Constrained Toll Conditions
ATMS	Advanced Transportation Management System - The use of ATMS as a mitigation measure is discretionary and subject to review and approval by the Director of Public Works. The ATMS program involves a variety of actions such as camera surveillance and centralized system control, and is part of traffic signal system improvements planned for implementation over time.
BO	Post-2040 Buildout Toll-Free Conditions
Cyn	Canyon
d	de facto right-turn
f	free right-turn
ICD	Irvine Center Drive
LCR	Laguna Canyon Road
L,T,R	left, through, right
Mit.	Mitigation
SB,WB,NB,EB	southbound, westbound, northbound, eastbound

It should be noted that the mitigation measures identified in Table 4-90 would be studied further at the time each Master Tentative Map (or equivalent) is submitted. The timing and need for these improvements would be based on an updated traffic study to maintain satisfactory levels of service. The mitigation measures presented here are subject to further refinement based on updated traffic forecasts that include any applicable land use and circulation revisions. Therefore, subsequent traffic studies will determine whether these mitigation measures and/or additional improvements, if any, are necessary based on the updated traffic forecasts. A modified set of mitigation measures are also provided in this report in the event the City of Irvine's performance criteria guidelines are amended to recognize LOS "E" as the acceptable level of service standard in the Irvine Spectrum (portions of Planning Areas 13, 30, 31, 32, 34, and 35) and other portions (Planning Areas 9 and 51) of the project study area for select intersections or allows reduced peak hour trip rates in Planning Area 13/Irvine Spectrum 4 and Planning Area 32/Irvine Spectrum 3 based on recent trip generation monitoring counts.

It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of programs implemented by existing regional transportation agencies. Caltrans is the lead agency for planning and implementing improvements to the freeway system and the toll roads. Caltrans monitors growth and land use changes throughout its service districts and in association with local planning agencies, is responsible for developing improvement plans as required to address the future needs of the State. Typically improvements to the freeways, toll roads, and on- and off-ramps are made to address both operational and capacity concerns. Capacity enhancements to these regional facilities can be achieved through a number of measures, which Caltrans studies and evaluates before programming them for implementation. Potential capacity enhancements could include, demand management through regulation and metering of traffic utilizing the freeway interchanges and ramps, selective time responsive ramp metering activation or termination, alternative lane deployment such as converting general purpose lanes to High Occupancy Lanes (HOV) or allowing the use of HOV lanes for general purpose traffic, implementation of auxiliary lanes in selected segments or within certain corridors, selective ramp and freeway shoulder use management, traffic advisory and intelligent transportation system measures, additional ramp entry and exit lanes, and facility widening are some of the measures typically utilized by Caltrans.

Caltrans evaluates and prioritizes these improvements on the basis of system needs, benefits, and their impacts in the region. In cooperation with local agencies, Caltrans funds and constructs the most feasible improvements in an expeditious manner to address traffic demands on the freeways and tollways. Through this process Caltrans can address the type and timing of improvements to accommodate the future expected growth and demand in the region.

Conclusions

With implementation of the required mitigation measures by the project, the planned local arterial highway circulation systems analyzed for 2007, 2025 (constrained and buildout network

assumptions) and Post-2040 have adequate capacity to accommodate the proposed project land uses or those locations on the circulation system adversely impacted by the project have been mitigated to maintain the same levels of service under no-project conditions. The mitigation measures presented in this traffic study are subject to further refinement based on updated traffic forecasts that include any applicable land use and circulation revisions. Therefore, subsequent traffic studies will determine whether these mitigation measures and/or additional improvements, if any, are necessary based on the updated traffic forecasts.

In addition, the traffic forecasts presented in this study for 2025 with buildout toll conditions and Post-2040 toll-free conditions showed that the re-designation of Jeffrey Road between SR-241 and Portola Parkway from a six-lane major to a four-lane primary arterial and the elimination of an unnamed collector between Irvine Boulevard and Trabuco Road would not cause any unmitigated impacts.

It should be noted that the mitigation measures identified in Table 4-89 will be studied further by each Master Tentative Map (or equivalent) traffic analysis. The timing and need for these improvements would be based on an updated traffic study to maintain satisfactory levels of service in accordance with the performance standards identified in this report. The mitigation measures presented here are subject to further refinement based on updated traffic forecasts that include any applicable land use and circulation revisions. Therefore, subsequent traffic studies will determine whether these mitigation measures and/or additional improvements, if any, are necessary based on the updated traffic forecasts. A modified set of mitigation measures are also provided in this report in the event the City of Irvine's performance criteria guidelines are amended to recognize LOS "E" as the acceptable level of service standard in the Irvine Spectrum and other portions of the project study area for select intersections or allows reduced peak hour trip rates in Planning Area 13/Irvine Spectrum 4 and Planning Area 32/Irvine Spectrum 3 based on recent trip generation monitoring counts.

It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of programs implemented by existing regional transportation agencies. Caltrans is the lead agency for planning and implementing improvements to the freeway system and the toll roads. Caltrans monitors growth and land use changes throughout its service districts and in association with local planning agencies, is responsible for developing improvement plans as required to address the future needs of the State. Typically improvements to the freeways, toll roads, and on- and off-ramps are made to address both operational and capacity concerns. Capacity enhancements to these regional facilities can be achieved through a number of measures, which Caltrans studies and evaluates before programming them for implementation. Potential capacity enhancements could include, demand management through regulation and metering of traffic utilizing the freeway interchanges and ramps, selective time responsive ramp metering activation or termination, alternative lane deployment such as converting general purpose lanes to High Occupancy Lanes (HOV) or allowing the use of HOV lanes for general purpose traffic, implementation of auxiliary

lanes in selected segments or within certain corridors, selective ramp and freeway shoulder use management, traffic advisory and intelligent transportation system measures, additional ramp entry and exit lanes, and facility widening are some of the measures typically utilized by Caltrans. Caltrans evaluates and prioritizes these improvements on the basis of system needs, benefits, and their impacts in the region. In cooperation with local agencies, Caltrans funds and constructs the most feasible improvements in an expeditious manner to address traffic demands on the freeways and tollways. Through this process Caltrans can address the type and timing of improvements to accommodate the future expected growth and demand in the region.

Special Future Case Scenarios

As part of the traffic analysis, a number of special or "sensitivity" issues have been analyzed and are discussed below. A more detailed discussion of these sensitivity issues is included in Appendix N.

"Probable Future Projects"

This scenario presents a sensitivity run under 2025 buildout toll network conditions assuming the buildout of the Northern Sphere Area project and the inclusion of "Probable Future Projects" identified in Section 3.11. These "Probable Future Projects" have either filed applications, are expected to be included in a March 2002 ballot measure or have been announced by The Irvine Company with the intent to modify existing approved plans. This sensitivity scenario is compared to the baseline 2025 buildout toll with-project forecasts. These "Probable Future Projects" include Lower Peters Canyon Intensity Transfer (Irvine Planning Area 4), Irvine Spectrum Housing (Planning Areas 17, 31, 33 and 34) and the recently approved Woodbridge General Plan Amendment (Irvine Planning Area 15). The City of Irvine's proposed Great Park Plan for the former Marine Corps Air Station (MCAS) El Toro is included. The City of Irvine's proposed Master Plan of Arterial Highways (MPAH) Amendment to delete Culver Drive between Portola Parkway and SR-241 is also included. Lastly, development reductions have been assumed in the East Orange area reflecting The Irvine Company's intention to expand permanent open space within this area.

Exhibit 4-76 and 4-77 show the average daily traffic (ADT) forecasts and volume/capacity (V/C) ratios for the study area circulation system for this sensitivity run. The purpose of this sensitivity run is to show the potential change in travel patterns attributed to the implementation of the "Probable Future Projects". Compared with the baseline with-project (2025 buildout toll network conditions), decreases in volume by 1,000 to 3,000 ADT occur on Sand Canyon Avenue between Trabuco Road and Irvine Center Drive with increases in volume by 3,000 to 5,000 ADT north of Trabuco Road to Portola Parkway. Volumes on Jeffrey Road north of Trabuco Road are higher than the baseline by 2,000 to 3,000 ADT with decreases south of Trabuco Road by 1,000 to 2,000 ADT. Volumes are noticeably lower northwest of the Great Park Plan area near the SR-133 on Irvine Boulevard and Trabuco Road and higher south and southeast of the area on Alton Parkway west of I-5 and on Irvine Boulevard north of Alton Parkway which is probably due to the absence of an east-west connection through the former MCAS El Toro site. Near the Culver Drive extension deletion area, Jeffrey

Road, Jamboree Road and SR-261 north of Portola Parkway increase by 3,000 to 4,000 ADT and Culver Drive decreases by 10,000 ADT south of Portola Parkway.

Exhibit 4-76 2025 (Toll Buildout) ADT Volumes - Not Approved Probable Future Projects

Exhibit 4-77 2025 (Toll Buildout) V/C Ratios - Not Approved Probable Future Projects

In general, the ICUs are lower than the baseline. However, significant change (defined when level of service changes from acceptable to unacceptable) does occur at Jamboree Road at Portola Parkway (PM ICU changes from .89 to .93), Alton Parkway at Irvine Boulevard (AM ICU changes from .67 to .92), Bake Parkway at Rockfield Boulevard (AM and PM ICUs change from .89 and .90, respectively, to 1.04 and 1.04), and Research Drive at Trabuco Road (AM ICU changes from .79 to .94). Two intersections (Bake Parkway at Rancho Parkway South and Sand Canyon Avenue at I-5 northbound ramps) previously identified in the baseline with-project (2025 buildout toll) as operating as unacceptable are forecast to operate at acceptable levels under this scenario.

General Plan Buildout with OCX (El Toro Aviation Plan)

This scenario presents the traffic conditions assuming the County's voter approved current plan for a commercial airport (28.8 MAP alternative) was implemented within the former MCAS El Toro site. Exhibit 4-78 presents the 2025 ADT forecasts and V/C ratios for this scenario. Except for the El Toro Aviation Plan, this sensitivity run has the same land use and circulation system assumptions as included in the 2025 buildout toll scenario presented previously. Compared with the baseline with-project (2025 buildout toll) Sand Canyon Avenue volumes north of I-5 increase by 3,000 to 14,000 ADT. Volumes south of I-5 on Sand Canyon Avenue decrease by 2,000 to 6,000 ADT. Jeffrey Road volumes north of I-5 increase by 1,000 to 6,000 ADT. Alton Parkway and Bake Parkway immediately north of I-5 would decrease by 7,000 ADT and 15,000 ADT, respectively.

Exhibit 4-78 2025 (Toll Buildout) ADT Volumes - El Toro Aviation Plan

Oak Canyon Crossing

This scenario presents a circulation alternative under 2025 buildout toll network conditions assuming the buildout of the Northern Sphere Area project and the inclusion of an extension of Oak Canyon from its existing terminus west of Sand Canyon Avenue to Trabuco Road. Exhibits 4-79 and 4-80 show the ADT forecasts and V/C ratios for the study area circulation system for this sensitivity run.

The purpose of this sensitivity run is to show the potential change in travel patterns attributed to the implementation of the Oak Canyon connection between Sand Canyon Avenue and Trabuco Road. In addition to a low projected use of the facility with 7,000 ADT, the effects of the crossing without an I-5 connection have been largely localized. Compared with the baseline with-project (2025 buildout toll network conditions), maximum decreases of 3,000 ADT occur on Sand Canyon Avenue north and south of I-5 and 2,000 ADT on Jeffrey Road north of I-5 with minimal increases of 1,000 ADT on Roosevelt Avenue and Trabuco Road east of Jeffrey Road.

In general, the ICUs are slightly lower or unaffected compared to the baseline. However, in the immediate vicinity of the proposed connection, increased ICU values occur at Jeffrey Road and Trabuco Road (PM ICU changes from 1.04 to 1.08), Jeffrey Road and Roosevelt (AM ICU changes from 1.25 to 1.32), and Sand Canyon Avenue and Trabuco Road (PM ICU changes from 1.00 to 1.02). The conditions at Sand Canyon Avenue and Road "B" access intersection to Planning Area 40/Irvine Spectrum 8 is somewhat alleviated with the connection (PM ICU changes from 1.22 to 1.12). The possibility of reducing the project impacts along Jeffrey Road and Sand Canyon Avenue by extending the Oak Canyon connection to Portola Parkway was analyzed. The portion of the Oak Canyon extension between Irvine Boulevard and Trabuco Road is consistent with the current City of Irvine MPAH assumption. A sensitivity run extending Oak Canyon to Portola Parkway showed that the projected volumes along Jeffrey Road and Sand Canyon Avenue with the project were not significantly modified by this extension (see comparative ICU results in Table 4-91).

Exhibit 4-79 2025 (Toll Buildout) ADT Volumes - Oak Canyon Crossing

Exhibit 4-80 2025 (Toll Buildout) V/C Ratios - Oak Canyon Crossing

Table 4-91
2025 Buildout ICU Summary
(Oak Canyon Crossing and Extension to Portola Parkway)

		NO-PROJECT		WITH-PROJECT		ALT. 1		ALT. 2	
	INTERSECTION	AM	PM	AM	PM	AM	PM	AM	PM
282.	Jeffrey Rd. at Portola Pk.	.66	.56	.78	.63	.76	.64	.80	.64
283.	Jeffrey Rd. at Irvine Bl.	.78	.74	.83	.90	.84	.90	.82	.88
284.	Jeffrey Rd. at Bryan Av.	.94	.45	1.03*	.62	1.04	.64	1.02	.61
285.	Jeffrey Rd. at Trabuco Rd.	.87	.87	1.02*	1.04*	1.01	1.08	.98	1.05
286.	Jeffrey Rd. at Roosevelt	1.25	.89	1.25	1.01*	1.32	.91	1.34	.92
287.	Jeffrey Rd. at I-5 NB Ramps	.62	.72	.71	.82	.69	.79	.70	.80
288.	Jeffrey Rd. at Walnut Av.	.79	.71	.85	.79	.82	.77	.85	.78
300.	Sand Cyn. Av. at Portola	.53	.57	.64	.61	.64	.59	.64	.58
301.	Sand Cyn. Av. at Irvine Bl.	.81	.71	.94*	.84	.95	.84	.95	.85
302.	Sand Cyn. Av. at Trabuco	.91	.90	1.05*	1.00*	1.02	1.02	1.00	.95
303.	Sand Cyn. Av. at I-5 NB Ramps	.55	.83	.67	.95*	.65	.95	.66	.92
304.	Sand Cyn. Av. at Marine Wy.	.59	1.01	.67	1.04*	.64	1.01	.64	1.01
305.	Sand Cyn. Av. at I-5 SB Ramps	.94	.78	1.07*	.86	1.04	.85	1.06	.85
306.	Sand Cyn. Av. at Oak Cyn.	.79	.76	.81	.79	.86	.79	.87	.79
482.	Road "A" at Trabuco Rd.	.53	.49	.60	.53	.55	.56	.66	.59
483.	Road "C" at Trabuco Rd.	.57	.43	.68	.55	.63	.54	.62	.50
484.	Sand Canyon Av. at Roosevelt	.78	.83	.83	1.02*	.78	1.00	.79	.95
485.	Sand Canyon Av. at Road "B"	.88	1.16	.95*	1.22*	.89	1.12	.88	1.13
519.	Collector St. at Irvine Bl.	.70	.57	.80	.95*	.79	.88	.86	.88
520.	Collector St. at Trabuco	.54	.31	.77	.38	.72	.39	.69	.35

ALT. 1 - Oak Canyon I-5 crossing to Trabuco Road with-project
ALT. 2 - Oak Canyon extension to Portola Parkway with-project

* Exceeds City of Irvine's performance criteria

Hicks Canyon Road/Yale Avenue Analysis

The Irvine Unified School District (IUSD) previously acquired a site for a middle school with assumed total enrollment of 1,000 students in Planning Area 5B (PA5B). It is assumed that this school will serve the existing Northwood community to the west and PA5B and PA9. The proposed zoning for PA5B includes the easterly extension of existing Hicks Canyon Road should the middle school remain in PA5B. The proposed zoning also states that the extension of this road will not occur if the middle school is relocated outside of PA5B. The impacts of relocating the middle school to two alternative sites in Planning Area 9 (PA9) are discussed below.

The IUSD has indicated that it is supportive of relocating the middle school to PA9. However, the required State approval of this relocation has not yet been obtained. Thus, in the event that the middle school remains at its current location in PA5B, this section analyzes four alternative access

concepts for the school and PA5B and how such access would impact Hicks Canyon Road and Yale Avenue within the existing Northwood community under 2025 buildout toll conditions as per the Scope of Work. Exhibit 4-81 illustrates these four alternative access alternatives and the middle school traffic generation distribution for each. The four alternatives are described as follows:

1) No vehicle access to the school or school drop-off on Hicks Canyon Road. Therefore all trips would be entering and exiting to and from Jeffrey Road. In addition, there would be no access to Hicks Canyon Road by PA5B.

2) All vehicle or pedestrian access to the school would only be on Hicks Canyon Road. No vehicle access to the school or school drop-off would be possible on the east side of the school. Therefore all trips would be entering and exiting from an extension of the existing Hicks Canyon Road.

3) Vehicle and pedestrian access to the school would be possible via Hicks Canyon Road on the west side and a PA5B internal roadway system on the east side. However, there would be no connection to allow through traffic on Hicks Canyon Road between Yale Avenue and Jeffrey Road.

4) Vehicle and pedestrian access would be possible from either side of the school. In addition, a connection is assumed that would allow through traffic on Hicks Canyon Road between Yale Avenue and Jeffrey Road.

Based on the capacity constraints at the intersection of Yale Avenue and Irvine Boulevard and roadway characteristics of the proposed extension of Hicks Canyon Road to Jeffrey Road, it has been assumed for Alternative 4 that approximately 40 percent of the traffic oriented to and from the southeast of PA5 and PA5B would utilize the extension of Hicks Canyon Road. It should be noted that no bypass traffic is assumed utilizing Orange Arrow to access the school in Alternatives 2 through 4.

Exhibit 4-81 Middle School Access Alternatives

Exhibit 4-82 shows the existing conditions for this area which form the basis for the future forecasts along Yale Avenue. Exhibits 4-83 through 4-87 illustrate the projected 2025 Buildout Toll ADT forecasts associated with the baseline conditions (no middle school or PA5B uses) and each alternative which assumes with-project conditions. It should be noted that the forecasts presented in this section differ from the 2025 buildout toll with-project forecasts which assumed equal project (school and residential) access to Yale Avenue and Jeffrey Road via a Hicks Canyon Road connection and no possibility of through traffic. Table 4-92 summarizes the corresponding ICU values. Exhibit 4-88 shows the lane configurations assumed in these ICU calculations. Using the City's performance guidelines, the intersection of Yale Avenue and Irvine Boulevard is adversely impacted in Alternatives 1, 2 and 3. This finding is consistent with the 2025 buildout toll with-project forecasts.

It should be noted that although Hicks Canyon Road east of Yale Avenue is analyzed here for impacts by the middle school, the school would still be obligated to provide an analysis to satisfy the California Environment Quality Act (CEQA) requirements. Site issues (i.e., access and off-site impacts) will be further studied in this document.

Table 4-93 shows comparative traffic volumes on Hicks Canyon Road for the four middle school access alternatives. The first (Alternative 1) is labeled the "base case" since no school traffic would use Hicks Canyon Road to access the school. Under Alternative 2, in which all school access is via Hicks Canyon Road, the ADT increases by 1,000 (from 2,400 in the base case to 3,400). The corresponding AM peak hour increase is 300 (from 210 to 510). For Alternative 3, in which school access is shared between Yale Avenue and Jeffrey Road, the base case ADT would increase from 2,400 to 2,700 (an increase of 300) and the AM peak hour would increase from 210 to 310 (an of increase of 100). In Alternative 4, which connects Hicks Canyon Road between Yale Avenue and Jeffrey Road, school traffic would be the same as in Alternative 3, but a component of through traffic would also be added. The ADT would increase from 2,400 in the base case to 5,700. The corresponding AM peak hour increase would be from 210 to 440.

Presently, the segment of Hicks Canyon Road is a cul-de-sac simply because it has yet to be constructed to join Jeffrey Road and 48-foot wide unstriped street with parking allowed and no driveways or residences fronting on the street which indicates that operationally the roadway is a collector. Hicks Canyon Road on the west side of Yale Avenue is also 48 feet wide and striped with two travel lanes, two bike lanes and a center two-way left-turn lane which is posted for a 40 miles per hour (mph) speed limit, all of which are indicative of a street operating as a collector. Hicks Canyon Road east of Yale Avenue, which is comparable in design to Hicks Canyon Road west of Yale Avenue as a collector, should be similarly striped with speed limit similarly posted.

Exhibit 4-82 Hicks Canyon Road/Yale Ave Analysis - Existing (2001) ADT and Peak Hour Volumes

Exhibit 4-83 2025 Buildout Toll Baseline (No-Project) ADT and Peak Hour Volumes - No Hicks Canyon Road Connection

Exhibit 4-84 2025 Buildout Toll Baseline (With-Project) ADT and Peak Hour Volumes - Middle School Access Alternative 1 (Base Case)

Exhibit 4-85 2025 Buildout Toll Baseline (With-Project) ADT and Peak Hour Volumes - Middle School Access Alternative 2

Exhibit 4-86 2025 Buildout Toll Baseline (With-Project) ADT and Peak Hour Volumes - Middle School Access Alternative 3

Exhibit 4-87 2025 Buildout Toll Baseline (With-Project) ADT and Peak Hour Volumes - Middle School Access Alternative 4

Table 4-92 ICU Summary 2025 (Buildout Toll Conditions)

Exhibit 4-88 Existing and Future Hicks Canyon Road/ Yale Ave Intersection Lane Configurations

Hicks Canyon Road east of Yale Avenue possesses some curvature in alignment with a few residential street intersections situated along its length. The design as it exists today met previous sight distance standards in 1977 when the roadway system in this area was built. Since then, the City of Irvine has changed the sight distance standards. According to the actual as-built street improvement plan as represented in Exhibit 4-89, the street design for sight distance complies with the current City of Irvine standards assuming that bike lanes are striped and red curb areas are designated which would allow the relocation of the limit lines. At a minimum, on-street parking will be eliminated wherever red curb areas are designated. Additional traffic due to the middle school and/or new housing in Alternatives 2 through 4 will not affect sight distance but increase the duration of wait time for side streets at each intersection. However, level of service along this segment of Hicks Canyon Road as discussed below would still be adequate.

The City of Irvine standard capacity for a two-lane collector roadway is 13,000 ADT. Examination of the alternatives indicates that simply constructing the school alone with 3,400 ADT or in combination with through traffic (resulting in 5,700 ADT) would not cause the capacity of Hicks Canyon Road to be exceeded (projected to be operating at level of service "A").

The City's peak hour link capacity analysis uses a basic peak hour capacity in one direction of 1,600 vehicles per hour (vph). All of the alternatives have peak hour volumes that would not exceed either the link capacity or intersection capacity on Hicks Canyon Road. The percentage difference (i.e., with and without the school) varies substantially, with Alternative 2 being the highest, and the increase being most notable in the AM peak hour. Because of the peaking characteristics of a school, this is the only time that school traffic would have some level of impact in terms of driveway access. However, even the highest volume (510 in two directions) is well below the maximum flow of 1,600 vph in one direction for continuous flow and would lead to the conclusion that adequate gaps would be available for driveway access.

Signal Warrants

Signal warrants are also performed for the intersections along Yale Avenue analyzed here with the exception of Orange Arrow, which is already proposed for signal installation and Portola Parkway and Irvine Boulevard which are already signalized. Traffic signal warrants based on peak hour volumes as adopted by the Federal Highway Administration and Caltrans were used here to determine the need for signalization. In applying this warrant, the volumes of both the major and minor street must meet or exceed those shown on the curves in Exhibits 4-90 and 4-91 under rural and urban conditions, respectively.

Table 4-93
Traffic Volume Comparison
Hicks Canyon Road

	ADT	AM PEAK HOUR
Base (Alt 1)	2,400	210
-No School Traffic		
School Alt. 2	1,000	300
School + Base	3,400	510
(School %)	29%	59%
School Alt. 3	300	100
School + Base	2,700	310
(School %)	11%	32%
Non-School	3,000	130
School Alt. 4	300	100
School + Base + Non-School	5,700	440
(School %)	5%	23%

Exhibits 4-89 Hicks Canyon Road Sight Distance Analysis

Exhibit 4-90 Peak Hour Signal Warrants (Higher Speed/Rural Areas)

Exhibits 4-91 Peak Hour Signal Warrants (Lower Speed/Urban Areas)

Determining the major street signal warrant volume involves calculating the number of vehicles approaching the intersection on both major street legs. The minor street peak hour signal warrant volume is the number of peak hour vehicles approaching the intersection on only the highest volume leg.

Rural or urban classifications are determined by the speed on the major street. Warrants are based on rural when the speed on the major street is 40 miles per hour (mph) or higher. For urban areas, the speed on the major street is 35 mph or lower. Speeds on Yale Avenue are expected to be higher than 35 mph therefore the signal warrants for intersections along Yale Avenue are based on rural.

A signal warrant analysis was carried out for the Yale Avenue intersections using the forecast approach volumes previously shown in Exhibits 4-84 and 4-87. The signal warrant volumes are summarized in Table 4-94. Based on the application of the warrant, traffic signals need to be installed at all intersections along Yale Avenue under baseline (no-project) conditions with the exception of Yale Avenue and Meadowood which meets signal warrants only when access to Hicks Canyon Road east of Yale Avenue is provided. Typically, signals are not installed until actual volumes meet or exceed the warrants.

Performance Criteria

Previous Exhibit 2-6 shows the intersections of which the performance criteria would be changed to allow a threshold of 1.00 (level of service (LOS) "E") as acceptable. Currently, the City of Irvine recognizes LOS "E" as acceptable for locations within the Irvine Business Complex (IBC)/PA36 and Irvine Center/PA33, and the Bake Parkway/I-5 northbound ramps and Congestion Management Program (CMP) intersections. If LOS "E" was adopted for the additional intersection locations in previous Exhibit 2-6, the resulting 2007, 2025 (constrained and buildout toll networks) and Post-2040 locations needing mitigation would be less. Table 4-95 is a summary of previously identified impacted locations (using LOS "D" as the criteria) taken from each of the impact analysis discussed earlier which is marked to show the locations deleted if the LOS "E" criteria was adopted. By implementing the level of service "E" (or ICU = 1.00) as acceptable, six locations in the 2025 constrained toll network scenario, four in the 2025 buildout toll network scenario and five in Post-2040 will no longer need project mitigation. In addition, mitigation for intersection #484, Sand Canyon Avenue at Roosevelt Avenue under 2025 (constrained toll and buildout toll) and Post-2040 conditions would be reduced (see Table 4-96 for an amended summary of mitigation measures with revised performance criteria).

Table 4-94 Peak Hour Signal Warrant Summary

Irvine Spectrum Trip Reduction

This scenario presents a sensitivity run comparing the buildout of the project during Post-2040 and toll-free conditions on the corridors in which peak hour trip reductions are reflected for the successful trip reduction program (Spectrumotion) implemented by The Irvine Company. Data was collected for Planning Area 13/Irvine Spectrum 4 and Planning Area 32/Irvine Spectrum 3 and compared with the adopted ITAM peak hour trip rates. Based on this trip monitoring data, the reduction is applied to the model forecasting by decreasing AM and PM inbound and outbound trips to and from Planning Area 13/Irvine Spectrum 4 and Planning Area 32/Irvine Spectrum 3 by 41 and two percent, respectively. Exhibits 4-92 and 4-93 show the ADT forecasts and V/C ratios for the study area circulation system for this sensitivity run.

Two locations (#306. Sand Canyon Avenue at Oak Canyon and #490. Research Drive at Trabuco Road) change from operating at unacceptable to acceptable levels with the Irvine Spectrum trip reduction (AM and PM peak hour ICUs = .84 and .88 for Sand Canyon Avenue at Oak Canyon and PM peak hour = .87 for Research Drive at Trabuco Road). Furthermore, if LOS "E" was adopted for the additional locations, two less intersections, #301. Sand Canyon Avenue at Irvine Boulevard and #316. SR-133 southbound ramps at Irvine Boulevard, for Post-2040 with Irvine Spectrum trip reduction would be needing mitigation (see Table 4-97 for an amended summary of Post-2040 mitigation measures with Irvine Spectrum trip reduction and also with revised performance criteria).

Table 4-95
Revised Summary of Impacted Intersections
(LOS "E" Performance Criteria)

LOCATION	NO-PROJECT AM	NO-PROJECT PM	WITH-PROJECT AM	WITH-PROJECT PM	DIFFERENCE AM	DIFFERENCE PM	IMPACT AM	IMPACT PM
2007								
127. Jamboree Rd & El Camino Real	.65	.94	.66	.96	.01	.02	-	c
133. Jamboree Rd at Edinger Av	1.03	.64	1.05	.65	.02	.01	c	-
485. Sand Cyn Av at Road "B"	.81	1.19	.82	1.21	.01	.02	-	c
2025 CONSTRAINED								
34. Red Hill Av at Irvine Bl	.94	1.04	.97	1.05	.03	.01	c	-
91. Tustin Ranch Rd at Irvine Bl	1.14	1.09	1.18	1.11	.04	.02	c	c
127. Jamboree Rd at El Camino Real	.65	.92	.67	.95	.02	.03	-	c
222. Culver Dr at Trabuco Rd	.66	1.03	.69	1.09	.03	.06	-	c
223. Culver Dr at I-5 SB Ramps	.74	.93	.75	1.02	.01	.09	-	c
224. Culver Dr at Walnut Av	.90	.87	.93	.91	.03	.04	p	p
235. Culver Dr at University Dr	.94	.99	.97	1.01	.03	.02	c	c
249. Yale Av at Irvine Bl	.90	.68	.99	.79	.09	.11	p	-
283. Jeffrey Rd at Irvine Bl	.77	.75	.99	.90	.22	.15	p	p
284. Jeffrey Rd at Bryan Av	.92	.44	.99	.62	.07	.18	c	-
285. Jeffrey Rd at Trabuco Rd	.89	.78	.96	1.02	.07	.24	p	p
286. Jeffrey Rd at Roosevelt	1.27	.86	1.26	1.00	-.01	.14	-	p
288. Jeffrey Rd at Walnut Av	.93	.84	1.01	.97	.08	.13	c	p
289. Jeffrey Rd at ICD	.87	1.00	.87	1.08	.00	.08	-	c
~~301. Sand Cyn Av at Irvine Bl~~	~~.67~~	~~.59~~	~~.96~~	~~.74~~	~~.29~~	~~.15~~	~~p~~	~~-~~
302. Sand Cyn Av at Trabuco Rd	1.00	1.00	1.08	1.12	.08	.12	c	c
~~303. Sand Cyn Av at I-5 NB Ramps~~	~~.51~~	~~.81~~	~~.67~~	~~1.00~~	~~.16~~	~~.19~~	~~-~~	~~p~~
304. Sand Cyn Av at Marine Wy	.57	.98	.66	1.06	.09	.08	-	c
305. Sand Cyn Av at I-5 SB Ramps	.91	.76	1.08	.86	.17	.10	c	-
311. Sand Cyn Av at I-405 NB Ramps	.91	.55	.95	.55	.04	.00	c	-
~~317. SR-133 NB Ramps at Irvine Bl~~	~~.84~~	~~.69~~	~~.91~~	~~.82~~	~~.07~~	~~.13~~	~~p~~	~~-~~
362. Bake Pkwy at Irvine Bl	1.24	.81	1.27	.86	.03	.05	c	-
364. Bake Plwy at Jeronimo Rd	1.19	.90	1.14	.91	-.05	.01	-	p
~~366. Bake Pkwy at Rockfield Bl~~	~~.89~~	~~.94~~	~~.91~~	~~.95~~	~~.02~~	~~.01~~	~~p~~	~~-~~
367. Bake Pkwy at I-5 NB Ramps	1.01	.63	1.03	.65	.02	.02	c	-
~~368. Bake Pkwy at I-5 SB Ramps~~	~~.88~~	~~.92~~	~~.89~~	~~.94~~	~~.01~~	~~.02~~	~~-~~	~~c~~
484. Sand Cyn Av at Roosevelt Av	.80	.81	.84	1.01	.04	.20	-	p
485. Sand Cyn Av at Road "B"	.85	1.14	.95	1.24	.10	.10	p	c
~~490. Research Dr at Trabuco Rd~~	~~.79~~	~~.90~~	~~.83~~	~~.91~~	~~.04~~	~~.01~~	~~-~~	~~p~~
507. Bake Pkwy at Millennium Bl	.95	.98	.99	1.02	.04	.04	c	c
512. Irvine Bl at Trabuco Rd	.87	.86	.92	.90	.05	.04	p	-
515a. Bake Pkwy at Rancho Pkwy N	.98	1.22	1.00	1.22	.02	.00	c	-

Table 4-95
Revised Summary of Impacted Intersections
(LOS "E" Performance Criteria)

LOCATION	NO-PROJECT AM	NO-PROJECT PM	WITH-PROJECT AM	WITH-PROJECT PM	DIFFERENCE AM	DIFFERENCE PM	IMPACT AM	IMPACT PM
2025 BUILDOUT								
34. Red Hill Av at Irvine Bl	.95	1.03	.97	1.06	.02	.03	c	c
91. Tustin Ranch Rd at Irvine Bl	.96	.93	.97	.95	.01	.02	-	c
125. Jamboree Rd at Irvine Bl	.97	.85	1.01	.88	.04	.03	c	-
223. Culver Dr at I-5 SB Ramps	.72	.90	.77	1.00	.05	.10	-	p
224. Culver Dr at Walnut Av	.91	.87	.94	.91	.03	.04	c	p
249. Yale Av at Irvine Bl	.99	.73	1.03	.84	.04	.11	c	-
284. Jeffrey Rd at Bryan Av	.94	.45	1.03	.62	.09	.17	c	-
285. Jeffrey Rd at Trabuco Rd	.87	.87	1.02	1.04	.15	.17	p	p
286. Jeffrey Rd at Roosevelt	1.25	.89	1.25	1.01	.00	.12	-	p
289. Jeffrey Rd at ICD	.86	1.00	.90	1.08	.04	.08	-	c
~~301. Sand Cyn Av at Irvine Bl~~	~~.81~~	~~.71~~	~~.94~~	~~.84~~	~~.13~~	~~.13~~	p	-
302. Sand Cyn Av at Trabuco Rd	.91	.90	1.05	1.00	.14	.10	c	p
~~303. Sand Cyn Av at I-5 NB Ramps~~	~~.55~~	~~.83~~	~~.67~~	~~.95~~	~~.12~~	~~.12~~	-	p
304. Sand Cyn Av at Marine Wy	.59	1.01	.67	1.04	.08	.03	-	c
305. Sand Cyn Av at I-5 SB Ramps	.94	.78	1.07	.86	.13	.08	c	p
311. Sand Cyn Av at I-405 NB Ramps	.95	.56	.97	.56	.02	.00	c	-
321. Laguna Cyn Rd at Old Laguna Cyn Rd	.86	.90	.88	.94	.02	.04	-	p
406. Laguna Cyn Rd at Lake Forest Dr	1.13	.89	1.15	.95	.02	.06	c	p
484. Sand Cyn Av at Roosevelt Av	.78	.83	.83	1.02	.05	.19	-	p
485. Sand Cyn Av at Road "B"	.88	1.16	.95	1.22	.07	.06	p	c
~~507. Bake Pkwy at Millennium Bl~~	~~.94~~	~~.93~~	~~.96~~	~~.96~~	~~.02~~	~~.03~~	c	c
515a. Bake Pkwy at Rancho Pkwy N	.88	1.22	.91	1.21	.03	-.01	p	-
515b. Bake Pkwy at Rancho Pkwy S	.89	.82	.92	.84	.03	.02	p	-
POST-2040								
34. Red Hill Av at Irvine Bl	.93	1.01	.95	1.02	.02	.01	c	-
91. Tustin Ranch Rd at Irvine Bl	.93	.88	.96	.89	.03	.01	c	-
223. Culver Dr at I-5 SB Ramps	.74	.93	.76	.98	.02	.05	-	c
224. Culver Dr at Walnut Av	.93	.87	.96	.91	.03	.04	c	p
249. Yale Av at Irvine Bl	.94	.73	1.02	.83	.08	.10	c	-
284. Jeffrey Rd at Bryan Av	.96	.46	1.02	.65	.06	.19	c	-
285. Jeffrey Rd at Trabuco Rd	.90	.88	1.00	1.05	.10	.17	p	p
286. Jeffrey Rd at Roosevelt	1.25	.90	1.27	1.02	.02	.12	c	p
289. Jeffrey Rd at ICD	.86	1.04	.91	1.11	.05	.07	p	c
~~301. Sand Cyn Av at Irvine Bl~~	~~.78~~	~~.69~~	~~.95~~	~~.83~~	~~.17~~	~~.14~~	p	-

Table 4-95
Revised Summary of Impacted Intersections
(LOS "E" Performance Criteria)

302. Sand Cyn Av at Trabuco Rd	.95	.94	1.07	1.01	.12	.07	c	c
303. Sand Cyn Av at I-5 NB Ramps	.55	.88	.65	1.07	.10	.19	-	p
304. Sand Cyn Av at Marine Wy	.59	1.05	.69	1.12	.10	.07	-	c
305. Sand Cyn Av at I-5 SB Ramps	.95	.82	1.10	.92	.15	.10	c	p
~~306. Sand Cyn Av at Oak Cyn~~	~~.82~~	~~.88~~	~~.89~~	~~.93~~	~~.07~~	~~.05~~	~~-~~	~~p~~
311. Sand Cyn Av at I-405 NB Ramps	1.00	.59	1.05	.61	.05	.02	c	-
~~316. SR-133 SB Ramps at Irvine Bl~~	~~.89~~	~~.56~~	~~.98~~	~~.68~~	~~.09~~	~~.12~~	~~p~~	~~-~~
452. Jamboree Rd at Santiago Cyn Rd	.88	.89	.91	.90	.03	.01	p	-
484. Sand Cyn Av at Roosevelt Av	.78	.84	.84	1.05	.06	.21	-	p
485. Sand Cyn Av at Road "B"	.89	1.14	.99	1.23	.10	.09	p	c
~~490. Research Dr at Trabuco Rd~~	~~.72~~	~~.85~~	~~.78~~	~~.91~~	~~.06~~	~~.06~~	~~-~~	~~p~~
~~507. Bake Pkwy at Millennium Bl~~	~~.95~~	~~.98~~	~~.97~~	~~1.00~~	~~.02~~	~~.02~~	~~c~~	~~c~~
515a. Bake Pkwy at Rancho Pkwy N	.89	1.11	.90	1.14	.01	.03	-	c
519. Collector St at Irvine Bl	.65	.55	.77	.91	.12	.36	-	p

Note: Locations no longer needing mitigation because of change in level of service from "D" to "E" are shown with a strikeout.
p - project causes deficiency
c - project contributes to deficiency

Level of service ranges: A=.00 - .60 B=.61 - .70 C=.71 - .80 D=.81 - .90 E=.91 - 1.00 F=Above 1.00

Table 4-96
Revised Mitigation Lanes for Impacted Intersections
(LOS "E" Performance Criteria)

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
34. Red Hill at Irvine	25C,25B,BO	1	2	0	1	3	0	2	1	1	1	3	0
	Mit.						d						
	Alt. Mit.	ATMS (City of Tustin)											
91. Tustin Ranch at Irvine	25C	1	3	f	2	2	1	1	3	1	2	3	1
	25B,BO					3							
	Mit.							2					
	Alt. Mit.	ATMS (City of Tustin)											
125. Jamboree at Irvine	25B	2	3	f	2	3	d	2	3	1	2	3	1
	Mit.	ATMS (City of Tustin)			(mit. not needed at BO)								
127. Jamboree at El Camino Real	07,25C	1	4	d	2	2	0	2	4	1	1	1	2
	Mit.	ATMS (City of Tustin)			(mit. not needed at 25B or BO)								
133. Jamboree at Edinger	07	2	0	1	2	3	1	2	0	f	2	3	1
	Mit.	ATMS (City of Tustin)			(mit. not needed at 25C,25B or BO)								
223. Culver at I-5 SB Ramps	25C	0	3	f	0	0	0	0	3	f	1.5	0	1.5
	25B,BO										2		2
	Mit.								4				
	Alt. Mit.										3		2
224. Culver at Walnut	25C,25B,BO	2	3	d	2	2	d	2	3	1	2	2	0
	Mit.					3							d
	Alt. Mit.	ATMS &											d
235. Culver at University	25C	1	3	0	2	3	d	1	3	d	2	3	0
	Mit.	(mit. not needed at 25B or BO)							2	2			
249. Yale at Irvine Bl	25C,25B,BO	2	2	d	1	3	d	1	2	d	1	3	d
	Mit.							2					
282. Jeffrey at Portola	25C	0	1	1	2	3	0	1	1	f	1	2	1
	Mit.	(mit. not needed at 25B or BO)										3	0
283. Jeffrey at Irvine	25C	2	3	1	2	2	1	2	3	1	1	2	1
	Mit.	(mit. not needed at 25B or BO)										3	
284. Jeffrey at Bryan	25C,25B,BO	1	3	1	1	1	0	2	3	d	1.5	.5	d
	Mit.										1		1.5
285. Jeffrey at Trabuco	25C,25B,BO	1	3	d	1	2	0	2	3	1	1	2	1
	Mit.	2	4		2		d				2		
286. Jeffrey at Roosevelt	25C,25B,BO	2	3	d	2	1	1	1	4	d	1	1	1
	Mit.					2	d					2	d

Table 4-96
Revised Mitigation Lanes for Impacted Intersections
(LOS "E" Performance Criteria)

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
289. Jeffrey at ICD	25C,25B,BO	2	3	1	2	3	1	2	3	1	2	4	f
	25C Mit.	3							4				
	25C Alt. Mit.	3	& ATMS										
	25B,BO Mit.	3											
~~301. Sand Cyn at Irvine~~	~~25C,25B,BO~~	~~2~~	~~3~~	~~1~~	~~2~~	~~3~~	~~1~~	~~2~~	~~3~~	~~1~~	~~2~~	~~3~~	~~1~~
	~~Mit.~~											~~4~~	
302. Sand Cyn at Trabuco	25C,25B,BO	2	3	d	2	2	0	2	3	1	2	2	1
	Mit.				3	3						3	
303. Sand Cyn at I-5 NB Ramps	~~25C~~	~~1~~	~~2~~	~~1~~	~~1~~	~~1~~	~~0~~	~~2~~	~~2~~	~~0~~	~~1.5~~	~~.5~~	~~1~~
	~~25C Mit.~~			~~f~~					~~3~~				
	~~25B,~~BO	0	3						3		2	1	
	~~25B,BO~~ Mit.			f									
304. Sand Cyn at Marine	25C	2	2	0	1	0	1	0	2	1	0	0	0
	25C Mit.								3				
	25B,BO		3		2				3	2			
	25B,BO Mit.								4				
305. Sand Cyn at I-5 SB Ramps	25C	2	2	0	0	0	0	0	2	d	1.5	0	1.5
	25C Mit.								3		2.5		
	25B,BO		3						3				
	25B,BO Mit.										2.5		
~~306. Sand Cyn at Oak Cyn.~~	~~BO~~	~~1~~	~~3~~	~~d~~	~~2~~	~~1~~	~~1~~	~~1~~	~~3~~	~~1~~	~~2~~	~~1~~	~~d~~
	~~Mit.~~	~~2~~				~~.5~~	~~1.5~~						
311. Sand Cyn at I-405 NB Ramps	25C,25B,BO	0	2	f	.5	0	1.5	0	2	f	0	0	0
	Mit.				1		2						
316. SR-133 SB Ramps at Irvine	BO	1.5	0	1.5	1	3	0	0	0	0	0	3	d
	Mit.											4	
~~317. SR-133 NB Ramps at Irvine~~	~~25C~~	~~0~~	~~0~~	~~0~~	~~0~~	~~3~~	~~0~~	~~1~~	~~0~~	~~2~~	~~0~~	~~3~~	~~f~~
	~~Mit.~~							~~1.5~~		~~2.5~~			
	~~Alt. Mit.~~	~~ATMS (mit. not needed at BO)~~											
321. LCR at Old LCR	25B	0	3	1	0	0	0	2	3	0	3	0	f
	Mit.							3					
362. Bake at Irvine	25C	2	3	1	2	3	1	1	3	1	2	3	1
	Mit.							2		d			
364. Bake at Jeronimo	25C	1	3	d	1	2	0	1	3	d	2	2	1
	Mit.*				2								
	Alt. Mit.	ATMS (mit. or alt. mit. not needed at 25B or BO)											

Table 4-96
Revised Mitigation Lanes for Impacted Intersections
(LOS "E" Performance Criteria)

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
~~366. Bake at Rockfield~~	~~25C~~	~~2~~	~~4~~	~~1~~	~~2~~	~~2~~	~~f~~	~~2~~	~~4~~	~~f~~	~~1~~	~~2~~	~~f~~
	~~Mit.~~		~~5~~	~~0~~									~~1~~
	~~Alt. Mit.~~	~~ATMS (mit. not needed at BO)~~											
367. Bake at I-5 NB Rmps	25C	0	3	f	1.5	0	1.5	0	4	f	0	0	0
	Mit.						2.5						
~~368. Bake at I-5 SB Rmps~~	~~25C~~	~~0~~	~~3~~	~~f~~	~~0~~	~~0~~	~~0~~	~~0~~	~~3~~	~~f~~	~~3~~	~~0~~	~~2~~
	~~Mit.~~	~~(mit. not needed at BO)~~						~~4~~					
406. LCR at Lake Forest	25B	2	3	0	1	0	f	0	3	1	0	0	0
	Mit.				2								
452. Jamboree at Santiago Cyn	BO	2	3	d	2	3	d	2	2	1	2	2.5	1.5
	Mit.		4										
484. Sand Cyn at Roosevelt	25C,25B,BO	1	3	0	1	1	0	1	3	0	1	1	0
	25C,25B Mit.			~~d~~			~~d~~			d			~~d~~
	BO Mit.						d						
485. Sand Cyn at Road "B"	07,25C,25B,BO	1	3	0	1	1	0	1	3	0	1	1	0
	Mit.			d	2		d	2					1
~~490. Research at Trabuco~~	~~25C,BO~~	~~1~~	~~1~~	~~f~~	~~1~~	~~3~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~	~~3~~	~~1~~
	~~Mit.~~	~~(mit. not needed at 25B)~~					~~2~~						
507. Bake at Millennium	25C~~,25B,BO~~	1	4	f	2	2	0	2	4	1	2	1	f
	25C Mit.		5	0									
	~~25B,BO Mit.~~					3	~~d~~					~~2~~	
512. Irvine at Trabuco	25C	2	3	f	2	3	f	2	3	d	2	3	f
	Mit.		4		(mit. not needed at BO)								
515a. Bake at Rancho North	25C,25B,BO	1	2	0	2	0	2	0	2	d	0	0	0
	Mit.				2.5		1.5						
515b. Rancho South	25B	0	2	1	0	0	0	1	2	0	2	0	1
	Mit.			f	(mit not needed at BO)								

Table 4-96
Revised Mitigation Lanes for Impacted Intersections
(LOS "E" Performance Criteria)

* Due to right-of-way constraints, the need for mitigation at this intersection will be re-evaluated in future studies to determine if an alternative mitigation is acceptable.

Note: This table is an amended mitigation measure summary showing locations no longer needing mitigation or needing less mitigation because of change in level of service from "D" to "E" (indicated with a strikeout).

Abbreviations (in alphabetical order):

07	2007 Conditions
25B	2025 Buildout Toll Conditions
25C	2025 Constrained Toll Conditions
Alt. Mit.	Alternative mitigation (for locations within the City of Irvine improvements are subject to approval by the City)
ATMS	Advanced Transportation Management System - The use of ATMS as a mitigation measure is discretionary and subject to review and approval by the Director of Public Works. The ATMS program involves a variety of actions such as camera surveillance and centralized system control, and is part of traffic signal system improvements planned for implementation over time.
BO	Post-2040 Buildout Toll-Free Conditions
Cyn	Canyon
d	de facto right-turn
f	free right-turn
ICD	Irvine Center Drive
LCR	Laguna Canyon Road
L,T,R	left, through, right
Mit.	Mitigation
SB,WB,NB,EB	southbound, westbound, northbound, eastbound

Exhibit 4-92 Post-2040 (Toll-Free) ADT Volumes - Spectrum Trip Reduction

Exhibit 4-93 Post-2040 (Toll-Free) V/C Ratios - Spectrum Trip Reduction

Table 4-97
Mitigation Lanes for Potentially Impacted Post-2040 Intersections
(Irvine Spectrum Trip Reduction)

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
34. Red Hill at Irvine	Base	1	2	0	1	3	0	2	1	1	1	3	0
	Mit.						d						
	Alt. Mit.	ATMS (City of Tustin)											
91. Tustin Ranch at Irvine	Base	1	3	f	2	3	1	1	3	1	2	3	1
	Mit.							2					
	Alt. Mit.	ATMS (City of Tustin)											
223. Culver at I-5 SB Ramps	Base	0	3	f	0	0	0	0	3	f	2	0	2
	Mit.								4				
	Alt. Mit.										3		2
224. Culver at Walnut	Base	2	3	d	2	2	d	2	3	1	2	2	0
	Mit.					3							d
	Alt. Mit.	ATMS &											d
249. Yale at Irvine Bl	Base	2	2	d	1	3	d	1	2	d	1	3	d
	Mit.							2					
284. Jeffrey at Bryan	Base	1	3	1	1	1	0	2	3	d	1.5	.5	d
	Mit.										1		1.5
285. Jeffrey at Trabuco	Base	1	3	d	1	2	0	2	3	1	1	2	1
	Mit.	2	4		2		d				2		
286. Jeffrey at Roosevelt	Base	2	3	d	2	1	1	1	4	d	1	1	1
	Mit.					2	d					2	d
289. Jeffrey at ICD	Base	2	3	1	2	3	1	2	3	1	2	4	f
	Mit.	3											
301. Sand Cyn at Irvine*	Base	2	3	1	2	3	1	2	3	1	2	3	1
	Mit.											4	
302. Sand Cyn at Trabuco	Base	2	3	d	2	2	0	2	3	1	2	2	1
	Mit.				3	3						3	
303. Sand Cyn at I-5 NB Ramps	Base	0	3	1	1	1	0	2	3	0	2	1	1
	Mit.			f									
304. Sand Cyn at Marine	Base	2	3	0	2	0	1	0	3	2	0	0	0
	Mit.								4				
305. Sand Cyn at I-5 SB Ramps	Base	2	3	0	0	0	0	0	3	d	1.5	0	1.5
	Mit.										2.5		

Table 4-97
Mitigation Lanes for Potentially Impacted Post-2040 Intersections
(Irvine Spectrum Trip Reduction)

LOCATION		— SB — L	T	R	— WB — L	T	R	— NB — L	T	R	— EB — L	T	R
~~306. Sand Cyn at Oak Cyn.~~	~~Base~~	~~1~~	~~3~~	~~d~~	~~2~~	~~1~~	~~1~~	~~1~~	~~3~~	~~1~~	~~2~~	~~1~~	~~d~~
	~~Mit.~~	~~2~~				~~.5~~	~~1.5~~						
311. Sand Cyn at I-405 NB Ramps	Base	0	2	f	.5	0	1.5	0	2	f	0	0	0
	Mit.				1		2						
316. SR-133 SB Ramps at Irvine*	Base	1.5	0	1.5	1	3	0	0	0	0	0	3	d
	Mit.											4	
452. Jamboree at Santiago Cyn	Base	2	3	d	2	3	d	2	2	1	2	2.5	1.5
	Mit.		4										
484. Sand Cyn at Roosevelt	Base	1	3	0	1	1	0	1	3	0	1	1	0
	Mit.						d			d			
485. Sand Cyn at Road "B"	Base	1	3	0	1	1	0	1	3	0	1	1	0
	Mit.							2					
~~490. Research at Trabuco~~	~~Base~~	~~1~~	~~1~~	~~f~~	~~1~~	~~3~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~	~~3~~	~~1~~
	~~Mit.~~							~~2~~					
507. Bake at Millennium	Base	1	4	f	2	2	0	2	4	1	2	1	f
	Mit.					3	d					2	
515a. Bake at Rancho North	Base	1	2	0	2	0	2	0	2	d	0	0	0
	Mit.				2.5		1.5						

* Intersection not needing mitigation with revised performance criteria and Irvine Spectrum trip reduction.

Note: This table is an amended Post-2040 mitigation measure summary showing locations no longer needing mitigation because of the trip reduction in Planning Area 13/Irvine Spectrum 4 and Planning Area 32/Irvine Spectrum 3 (indicated with a strikeout). Revisions to the mitigation due to change in level of service from "D" to "E" in addition to the trip reduction is indicated by an asterisk.

Abbreviations (in alphabetical order):

Alt. Mit.	Alternative mitigation (for locations within the City of Irvine improvements are subject to approval by the City)
ATMS	Advanced Transportation Management System - The use of ATMS as a mitigation measure is discretionary and subject to review and approval by the Director of Public Works. The ATMS program involves a variety of actions such as camera surveillance and centralized system control, and is part of traffic signal system improvements planned for implementation over time.
Base	Post-2040 Buildout Toll-Free Conditions without Mitigation
Cyn	Canyon
d	de facto right-turn
f	free right-turn
ICD	Irvine Center Drive
L,T,R	left, through, right
Mit.	Mitigation
SB,WB,NB,EB	southbound, westbound, northbound, eastbound

Circulation Phasing Report Intersections

There are several locations included in this analysis that are identified as impacted Circulation Phasing Report intersections by a July 12, 1999, action of the Transportation and Infrastructure Commission. Table 4-98 presents the corresponding 2007 ICU results for these locations. It should be noted that the ICUs listed here may be different from the Circulation Phasing report because of the updated modeling assumptions reflected throughout this current traffic study. The updated model includes more recent land use and network assumptions that would affect the trip generation and trip distribution in the analysis area. Also, key roadway links and intersection locations in the study area were validated with new counts taken in late 2000, early 2001. As can be seen in Table 4-98, the project does not adversely impact any of the subject intersections.

Congestion Management Program (CMP) Checklist

The Congestion Management Program (CMP) legislation requires that the CMP Agency monitor the implementation of the Orange County CMP, including CMP land use coordination component requirements. One location within the study area which is a part of the CMP Highway System is adversely impacted by the project for 2007 conditions. This location is Jamboree Road at Edinger Avenue.

Pedestrian and Bicycle Circulation

The project area is planned to provide a system of private and public sidewalks and pathways to accommodate the recreational and transportation needs of the residents. These facilities will provide access to recreational facilities, public amenities, commercial centers, bus stops, and provide for an alternative mode of transportation for the area residents. These facilities are planned to be designed in conjunction with the planning and design activities at the subdivision map level for each portion of the Northern Sphere Area.

Additionally, the project will implement the Jeffrey Open Space Spine trail, which consists of a Class I off-street trail for pedestrian and bicycle uses. This facility will be implemented within the limits of the project from Trabuco Road to north of Portola Parkway, and may also include linkages and/or gap closures to other portions of the Jeffrey Open Space Spine. The appropriateness and/or need for the project to provide linkages and/or gap closures shall be further investigated with subsequent subdivision applications. The development of the Jeffrey Open Space Spine will be consistent with the Jeffrey Open Space Spine Master Plan being developed by the City.

Bicycle lanes will be provided along all public arterials in accordance with the City's standards and the General Plan. These facilities in addition to a system of internal pathways within each project area will serve the needs of recreational and experienced cyclists. The planned trails also provide an alternative mode of transportation for those who wish to ride their bicycle to work, shopping, school, and other destinations.

Table 4-98
Circulation Phasing Intersection Improvement Locations by Priority Level
(Within Study Area)

	NO-PROJECT				WITH-PROJECT			
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
INTERSECTION	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
HIGH PRIORITY LOCATIONS								
Bake & Trabuco	1.05	F	.83	D	1.03	F	.83	D
Jeffrey & ICD	.69	B	.82	D	.69	B	.85	D
Jamboree & Barranca	.85	D	1.00	E	.84	D	1.00	E
Culver & Alton	.79	C	.92	E	.80	C	.92	E
West Yale Loop & Alton	.47	A	.64	B	.48	A	.65	B
ICD & I-405 SB Ramps	.88	D	.72	C	.88	D	.71	C
ICD & Lake Forest	.63	B	.70	B	.63	B	.70	B
Jeffrey & I-405 NB Ramps	.58	A	.73	C	.57	A	.74	C
Sand Canyon & Marine Way	.47	A	.48	A	.47	A	.50	A
Barranca & ICD	.67	B	.62	B	.67	B	.61	B
MEDIUM PRIORITY LOCATIONS								
Sand Canyon & Irvine Bl.	.61	B	.52	A	.68	B	.51	A
Sand Canyon & ICD	.49	A	.50	A	.49	A	.50	A
Jeffrey & Alton[1]	.79	C	.62	B	.80	C	.64	B
Sand Canyon & Alton	.67	B	.52	A	.67	B	.52	A
University & I-405 SB Ramps	.59	A	.63	B	.59	A	.64	B
Bake & ICD	.44	A	.43	A	.45	A	.43	A
I-5 SB Ramps & Bake	1.07	F	1.00	E	1.06	F	1.00	E
LOW PRIORITY LOCATIONS								
Alton & Toledo	.53	A	.57	A	.53	A	.57	A
ICD & Scientific Way	.52	A	.64	B	.51	A	.64	B
Ada & Alton	.51	A	.71	C	.49	A	.71	C

[1] Reflects Woodbridge Mixed Use Site project ATMS credit

In conjunction with the submittal of future subdivision maps and street improvement plans for the project area the applicant shall contact Orange County Transportation Authority's bus planning department to identify the existing and planned bus routes and bus stop locations. The street improvement plans will include the implementation of these facilities. Also, public sidewalks and pedestrian paths from adjacent development will be planned to provide convenient access to these facilities.

The street improvement plans and the planning and design of abutting development will be coordinated through the subdivision map process to ensure that conflicts between pedestrian, bicycle and vehicular traffic are minimized. Appropriate traffic control measures in accordance with City standards will be implemented in the design of the street improvements to ensure the optimum level of safety.

Through the implementation of the on-street and off-street trails, and a system of public and private sidewalks within the project area, as stated above, the goals of the City's General Plan (Objectives B-3 and B-4)) for providing alternative modes of transportation and recreational amenities will be met by the proposed development.

Project Access and Circulation Analysis

Project access and internal circulation are critical elements of a project development. Access from a major new development area to the existing abutting arterials is typically planned at two levels. The first level is through the implementation of missing segments of the City's Master Plan of Arterial Highways, as appropriate, and new arterials through the project area. An example of this type of access is the extension of Bryan Avenue to portions of the project area. This traffic study has addressed the design features, potential impacts and appropriate mitigation measures, where needed, of these facilities.

The second level is a more localized and land use specific system, which will be implemented in the future phases of the project. These elements of a project are developed in the subsequent stages of project planning and design which follow the current zoning action. The next step in the project implementation is the subdivision process. Project access and internal circulation along with a more detailed and refined land use plan are established at this stage of development. In conjunction with the subdivision map process, a subsequent traffic study will be conducted to address the operational characteristics of the project such as internal circulation, access, and traffic control measures.

Additionally, at this stage of project development, site grading and design features are more refined which enable the proper alignment selection, roadway design, infrastructure planning and design for the circulation system. Roadway design will be completed in accordance with the City of Irvine standards and will be subject to review and approval process by appropriate agencies.

Through these stages of project planning and design the goals and objectives of the City of Irvine's General Plan (Objectives B-1 and B-2) will be implemented with the best available information. The City of Irvine will also be able to conduct its review and oversight role in the design of these facilities more efficiently and with the most relevant information through the utilization of map level traffic studies.

Middle School Relocation

This section presents information on the possible relocation of the proposed middle school in PA5B to Planning Area 9A (Alternative 1) or Planning Area 9B (Alternative 2). Exhibit 4-94 illustrates the study area that was identified for this special analysis. As discussed previously, it is assumed that Hicks Canyon Road would not be extended into Planning Area 5B with these two scenarios. The ICU results are summarized in Table 4-99. As can be seen from this table, intersection #283. Jeffrey Road at Irvine Boulevard operates from an acceptable level of service to an unacceptable level of service in the PM peak hour thereby needing mitigation. This would be the only change to the mitigation measures summary presented previously for 2025 buildout toll conditions. The potential mitigation measure for this location could be to add a fourth northbound through lane resulting in a PM ICU of .85 for both Alternatives 1 and 2.

Exhibit 4-94 Middle School Relocation Site Alternatives

Table 4-99
ICU Summary - Middle School Relocation Alternatives (With-Project)

INTERSECTION	BASELINE AM	BASELINE PM	RELOCATION ALT. 1 AM	RELOCATION ALT. 1 PM	RELOCATION ALT. 2 AM	RELOCATION ALT. 2 PM
218 Culver Dr. at Portola Pkwy.	.75	.47	.75	.47	.74	.46
220 Culver Dr. at Irvine Bl.	.76	.77	.76	.76	.77	.76
221 Culver Dr. at Bryan Av.	.75	.66	.75	.66	.76	.67
222 Culver Dr. at Trabuco Rd.	.72	.88	.73	.87	.73	.88
223 Culver Dr. at I-5 SB Ramps	.77	1.00*	.75	1.00*	.74	1.00*
224 Culver Dr. at Walnut Av.	.94*	.91*	.95*	.91*	.95*	.91*
249 Yale Av. at Irvine Bl.	1.03*	.84	1.02*	.82	1.03*	.81
252 Yale Av. at Bryan Av.	.36	.51	.36	.50	.36	.50
255 Yale Av. at Trabuco Rd.	.68	.56	.65	.57	.65	.56
259 Yale Av. at Walnut Av.	.54	.77	.54	.78	.54	.77
282 Jeffrey Rd. at Portola Pkwy.	.78	.63	.77	.64	.77	.65
283 Jeffrey Rd. at Irvine Bl.	.83	.90	.84	.92*	.85	.92*
284 Jeffrey Rd. at Bryan Av.	1.03*	.62	1.03*	.64	1.02*	.62
285 Jeffrey Rd. at Trabuco Rd.	1.02*	1.04*	.99*	1.06*	.99*	1.05*
286 Jeffrey Rd. at Roosevelt	1.25*	.92*	1.25*	.91*	1.26*	.92*
287 Jeffrey Rd. at I-5 NB Ramps	.71	.82	.70	.82	.71	.82
288 Jeffrey Rd. at Walnut Av.	.85	.79	.85	.79	.85	.79
300 Sand Cyn. Av. at Portola Pkwy.	.64	.61	.63	.59	.64	.61
301 Sand Cyn. Av. at Irvine Bl.	.94*	.84	.95*	.84	.95*	.83
302 Sand Cyn. Av. at Trabuco Rd.	1.05*	1.00*	1.03*	1.01*	1.03*	1.00*
303 Sand Cyn. Av. at I-5 NB Ramps	.67	.95*	.67	.97*	.67	.97*
304 Sand Cyn. Av. at Marine Wy.	.67	1.04*	.66	1.04*	.67	1.05*
305 Sand Cyn. Av. at I-5 SB Ramps	1.07*	.86	1.07*	.86	1.07*	.86
316 SR-133 SB Ramps at Irvine Bl.	.83	.61	.85	.60	.83	.59
317 SR-133 NB Ramps at Irvine Bl.	.89	.87	.90	.87	.90	.86
402 I-5 NB Ramps at Trabuco Rd.	.79	.78	.76	.80	.76	.78
482 Road "A" at Trabuco Rd.	.60	.53	.57	.56	.57	.53
483 Road "C" at Trabuco Rd.	.68	.55	.65	.56	.65	.55
484 Sand Canyon Av. at Roosevelt	.83	1.02*	.84	1.02*	.83	1.01*
485 Sand Canyon Av. at Road "B"	.95*	1.22*	.96*	1.21*	.96*	1.22*
486 SR-133 SB Ramps at Trabuco Rd.	.61	.50	.59	.51	.59	.49
487 SR-133 NB Ramps at Trabuco Rd.	.85	.77	.85	.77	.85	.77
488 Research Dr. at Portola Pkwy.	.79	.87	.79	.87	.79	.87
489 Research Dr. at Irvine Bl.	.75	.88	.76	.86	.76	.87
490 Research Dr. at Trabuco Rd.	.79	.88	.78	.89	.78	.87
491 Research Dr. at Marine Wy.	.45	.47	.45	.47	.45	.46
519 Collector St. at Irvine Bl.	.80	.89	.80	.88	.78	.88
520 Collector St. at Trabuco Rd.	.77	.38	.74	.39	.73	.38

Table 4-99
ICU Summary - Middle School Relocation Alternatives (With-Project)

* Exceeds LOS "D"

Level of service ranges:	.00 - .60	A
	.61 - .70	B
	.71 - .80	C
	.81 - .90	D
	.91 - 1.00	E
	Above 1.00	F

Cumulative Impacts

The 2025 and Post-2040 analyses consider total traffic volumes associated with buildout of the City of Irvine (including, but not limited to, the Northern Sphere Area, Spectrum 8/Planning Area 40, and the Millennium Plan II) and surrounding area in accordance with the adopted General Plan. As a result, the 2025 and Post-2040 analyses assesses the traffic impacts of all cumulative development anticipated by the year 2025 and beyond. As shown above, all intersections will operate at acceptable levels of service with existing or planned improvements. As a result, cumulative traffic impacts are not considered significant.

4.14.3 MITIGATION MEASURES

Existing Regulations and Standard Conditions

14.1 This project necessitates the construction of public and/or private infrastructure improvements. Prior to the issuance of preliminary or precise grading permits, the landowner or subsequent project applicant shall construct, or enter into an agreement and post security, in a form and amount acceptable to the City Engineer, guaranteeing the construction of the following public and/or private improvements, in conformance with applicable City standards and the City's Capital Improvement Policy. (Standard Condition 1.1)

Street improvements including, but not limited to: pavement, curb and gutter, medians, sidewalks, drive approaches, street lighting, signing, striping as follows:

1. Traffic signal systems, interconnect and other traffic control and management devices as required by applicable City standards.
2. Storm drain facilities.
3. Subdrain facilities.
4. Landscaping and computerized irrigation control system (for all public streets, parks and public areas).

5. Sewer, reclaimed and/or domestic water systems, as required by the appropriate sewer and water districts as well as the Orange County Fire Authority when appropriate.
6. Riding, hiking and bicycle trails adjacent to or through the project site.
7. Undergrounding of existing overhead and proposed utility distribution lines.
8. Transit-related improvements depicted on the approved tentative map.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to traffic impacts have been proposed.

Additional Mitigation Measures

As described above, all roadways and intersections will continue to operate at acceptable levels of service provided that existing and planned roadway improvements are implemented. The following mitigation measures will ensure that the proposed project contributes to these planned roadway improvements on a pro-rata "fair-share" basis.

14.2 Prior to the issuance of building permits for the adjacent Planning Area, the landowner or subsequent project applicant shall dedicate the required right-of-way and construct or bond for roadway improvements to City of Irvine Master Plan of Arterial Highways (MPAH) standards for Jeffrey Road, Sand Canyon Avenue, Portola Parkway, Irvine Boulevard, and Trabuco Road.

14.3 Prior to the release of the Final Map for Planning Area 9 and/or Planning Area 8A by the City, the applicant shall coordinate with the City of Tustin regarding participation in the ATMS program at the Jamboree Road/El Camino Real, Tustin Ranch Road/Irvine Boulevard, Red Hill Avenue/Irvine Boulevard, Jamboree Road/Irvine Boulevard and Jamboree Road/Edinger Avenue intersections.

14.4 Prior to recordation of each final map for the project, the Applicant shall apply for annexation of any non-residential areas (except institutional areas within the project and except community commercial in PA6) within such final map area to the Irvine Spectrum Transportation Management Association (Spectrumotion) in accordance with Article X of the recorded Declaration of Covenants, Conditions and Restrictions (CC&R's) for Spectrumotion including any supplementary and amended CC&R's. The purpose of this mitigation measure is to reduce traffic, air quality and noise impacts. Should annexation into Spectrumotion not be approved, the Applicant shall develop a similar transportation management plan to the satisfaction of the City.

14.5 Prior to approval of each Master Tentative Map or equivalent, the landowner or subsequent project applicant shall prepare, subject to City approval, an updated traffic study inclusive of a phasing plan for traffic improvements associated with the subject Master Tentative Map. The phasing plan will specify the timing, funding, construction and fair-share responsibilities for all traffic improvements based on the updated traffic study to maintain satisfactory levels of service. The updated traffic study will determine whether those traffic mitigation improvements listed in Table 4-89 and/or additional traffic improvements, if any, are necessary based on updated traffic forecasts. The updated traffic study will evaluate the cumulative impact of the subject map and all previously approved or concurrently submitted maps, along with corresponding roadway mitigations within the Protocol Area. The methodology for study area, applicable land use and circulation modifications and standards for assessing and mitigating impacts employed in the updated traffic study shall be consistent with a City approved traffic study scope-of-work. The landowner or subsequent project applicant shall construct, bond for or enter into a funding agreement for necessary circulation system improvements.

4.14.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

As described above, all roadways and intersections will continue to operate at acceptable levels of service provided that existing and planned roadway improvements are implemented. As a result, potential traffic impacts can be mitigated to a level of insignificance.

While potential impacts to the freeway/tollway mainline segments and ramps have been evaluated, this analysis assumes that implementation of freeway and ramp improvements, except for ramp intersections with arterial streets, will be the responsibility of the existing regional transportation agencies. A number of programs are in place in Orange County to improve and upgrade the regional transportation system. These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), and the Orange County Transportation Authority (OCTA) Measure M program.

It has been assumed in the traffic analysis that the cumulative impact of project traffic along with other regional growth at the identified impacted ramp locations will be mitigated through a combination of the above discussed programs. For example, Caltrans is currently preparing a Project Study Report for the widening of the I-5 southbound off-ramp at Culver Drive to two lanes. However, if these programs are not implemented by the agencies with the responsibility to do so, the project's freeway/tollway ramp impacts would remain significant and unmitigated.

4.15 Utilities and Service Systems

The following threshold was identified in the initial study as a potentially significant impact:

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

This potential impact was previously addressed in Section 4.8, "Hydrology/Water Quality."

4.15.1 ELECTRICAL SERVICE

Environmental Setting

The property is located within the service territory of the Southern California Edison Company (SCE). The site currently has no residential usage of electricity. Electricity is currently used for several agricultural facilities, including but not limited to Hines Nursery, B & E Farms and the Valencia Packing House. SCE has transmission and distribution lines in the project area, located along Jeffrey Road, Trabuco Road, and Sand Canyon Avenue which serve the project area, nearby residential uses, and any new development in the surrounding area (Planning Area 40/Spectrum 8 DEIR, January 2001). SCE currently has three separate 66kv transmission circuits within the project area and two separate 12kv distribution circuits within the project area. (RGI Report, October 2001)

Environmental Impacts

Based on SCE's electrical consumption rate of 6,081 kilowatt hours (kWh) per year per residential dwelling unit, the residential component of the proposed project would consume approximately 75.1 million kWh annually. The proposed project also includes Multi-Use, Community Commercial, Commercial Recreation, Medical and Science and Institutional uses. As Multi-Use, Community Commercial, Medical and Science and Institutional uses vary greatly in type and size, neither SCE nor the South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook (the "SCAQMD Handbook") attempt to maintain predictive generation rates for these land uses as such.[33] Moreover, there is no available density or intensity multiplier for attempting to forecast electrical uses for Institutional uses. However, if a "miscellaneous" land use category from the SCAQMD Handbook is assigned to the entirety of the 7,316,000 square feet of proposed Multi-Use, Community Commercial, and Medical and Science uses in the project, those uses would consume an additional 76.8 million kWh per year, which when combined with the residential consumption, would result in a gross total project demand of 151.9 million kWh per year.

To place this energy demand in perspective, the total net energy for load in the SCE transmission service area, in which this project is located, for the year 2000 amounted to 98,269 gigawatt hours

[33] *Personal communication with Joe Carton, Service Planner with Southern California Edison, January 9, 1999.*

(GWh) per year. (CEC, California Energy Demand 2002-2012 Forecast.) For the year 2012, the California Energy Council (CEC) forecasts net energy for load demand for SCE customers in its service area at 125,224 GWh. The project's projected demand for electricity amounts to 0.11% of the total predicted demand, at the same time the CEC is using a 2 percent annual growth rate in projected electricity demand for the SCE service area.

SCE has indicated its ability to serve the proposed project, in accordance with all applicable tariff schedules which are the effective rates and rules of the Southern California Edison Company on file with and approved by the Public Utilities Commission, State of California, and subject to the receipt of such permits or other authorizations from public agencies as may be required for such installation. Project-related electricity demand will not significantly impact SCE's current level of service, provided the mitigation measures listed below are incorporated into the proposed project.

On a Statewide perspective, California recently endured limited, short-term disruptions of its electrical energy supply, termed by many as a "crisis"as a result of the recent restructuring of the State's utility industry. This "energy crisis" involved escalated electricity rates, threatened and to a much lesser extent instituted rolling blackouts, real and threatened investor-owned utility bankruptcies, and State subsidization of wholesale purchases of electricity for consumers. There was even worry that this "crisis" was indicative of excessive demand and/or a physical shortage of electrical energy supply now and in the future, such that a project such as the proposed project should be viewed as having a significant impact on electrical resources. However, the "crisis" was not related to increasing demand or to the adequacy of current and forecasted electrical energy supplies but, rather, the related to the high cost to purchase such energy due to economic rather than environmental factors. In fact, peak demand in 2000 was actually lower than peak demand in 1999 (William Reese, chair, California Energy Commission, Cal-Tax Digest, May 2001.).

Several economic factors, including primarily California's partial deregulation of energy utilities, led to high energy prices through the Spring 2001. As part of the partial deregulation of the electricity industry in the 1990's, California's main investor-owned utilities agreed to a mandated cap on the price they could charge retail customers for electricity. They were also required to divest themselves of much of their generation capacity, in order to create a private generation spot-market. However, there was no similar cap on the wholesale prices that public and private generators could charge the investor-owned utilities. Consequently, California investor-owned utilities were placed in a position where they were being charged far more in wholesale prices for electricity than they could recoup in retail electricity rates from their customers. The recent "crisis" was, in other words, largely economic in origin, triggering a concern that these utilities would be unable to continue to provide their customers with electricity at their current costs and may face bankruptcy.

The State of California has aggressively pursued solutions to this short-term economic situation through Congressional action, applications for rulings to the Federal Energy Regulatory Commission, and gathering evidence for potential legal action against the wholesale providers for unfair business practices under the California Business and Professions Code. The State has also

accelerated permitting for new generation facilities, stepped up a public awareness program, and entered into long-term supply contracts. As a result of these actions, electricity prices are now falling, and the state is now facing an energy "glut," rather than an energy shortfall. (LA Times, Saturday, August 11, 2001).

As of March 2001, the CEC predicted that in an "average" year, without adjustments for demand-reducing responses to high energy costs and threats of rolling blackouts, the peak hour demand for electricity in California, including a 7 percent "reserve," would be 57,909 Megawatts (MW), and in a "hotter" once-in-ten-year scenario 61,125 MW. It also predicted that state-wide peak-load surpluses from 9,385 MW to 6,169 MW would prevail, taking into account existing generation sources, various supply enhancements then available, and demand-reducing actions and responses to the perceived short-term "crisis." (Source, Legislative Analyst's Office Assessment for the Assembly Subcommittee on Electrical Energy Oversight, March 13, 2001, Exhibit 1 ("LAO Letter"). The CEC also reviewed overall growth projections in energy demand statewide through the year 2010, and compared those demand projections with projections on increased supplies, and concluded that net energy for load would exceed consumption by between 9,000 and 10,000 MW per year. (Summer of 2001 Forecasted Electricity Demand and Supplies, CEC Staff Report November 2000, Table B-9.)

Since 1999, the California Energy Commission has approved 16 power plants each greater than 300 MW, representing a total new capacity of 10,403 MW. Ten (10) of those plants (totaling 7,007 MW) are currently under construction, with 4 plants (totaling 1,829 MW) scheduled to come on-line by the end of 2001. An additional 13 power plant applications were under review by the CEC as of July 9, 2001, representing an additional 5,586 MW. Taking into account the larger Western Systems Coordinating Council (WSCC) region, which is the regional market for electricity production that includes California, as of July 2001 there was a total of 23,777 MW of new generation capacity under construction, and another 77,794 MW in various stages of the regulatory approval process.

The above measures (along with at least four bills adopted this year intended to provide rate relief for investor-owned utilities, encourage generation production, and promote energy conservation in older, energy-inefficient buildings) will ensure California has adequate electricity energy supply capacity and the ability to meet or exceed state-wide peak load demands. To the extent a "crisis" exists, it is a short-lived economic issue and is being addressed at the highest priority on a statewide and regional basis. There is no forecasted energy supply shortfall for the years in which this project is projected to be completed.

Cumulative Impacts

While sufficient power and distribution capabilities exist to provide the proposed project with electrical service, SCE has established that an additional substation will be necessary to provide the power and power grid necessary to support future growth in the vicinity (e.g. Planning Areas 1 and 2 and future reuse of the former MCAS El Toro). SCE is currently conducting studies to determine

the optimum location for the new routes to the substation in conjunction with the property owner. One such location being reviewed is the northwest corner of Jeffrey Road and Portola Parkway within Planning Area 2. Prior to the final decision to locate this additional substation required CEQA review will be necessary. In the interim SCE has indicated that they have more than sufficient circuit capacity to feed the project area once the infrastructure for the development is installed. Although electrical consumption will increase as a result of cumulative development, SCE is expanding its facilities to accommodate this growth. This growth in consumption is not considered significant since the demand can be met.

Mitigation Measures

Existing Regulations and Standard Conditions

15.1 The project shall comply with City of Irvine and State of California Insulation Standards and utilize energy efficient appliances to aid in conservation of energy resources.

15.2 The project shall comply with all the State Energy Insulation Standards (Title 24) and City of Irvine codes in effect at the time of application for building permits.

15.3 This development necessitates the construction of public and/or private infrastructure improvements. Prior to the release of a final map by the City, the landowner or subsequent project applicant shall construct, or enter into an agreement and post security, in a form and amount acceptable to the City Engineer, guaranteeing the undergrounding proposed utility distribution lines, in conformance with applicable City standards and the City's Capital Improvement Policy. (Standard Condition 1.1)

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to electrical service impacts have been proposed.

Additional Mitigation Measures

15.4 Development maps shall be conditioned to require that all electrical service lines (excluding transmission lines) serving development within the Northern Sphere Area will be underground.

Level of Significance after Mitigation

Implementation of the recommended mitigation measures will further reduce any identified impacts on electrical service to a level of insignificance.

4.15.2 NATURAL GAS SERVICE

Environmental Setting

The Southern California Gas Company (SCG) currently provides natural gas in the vicinity of the project site. Currently, SCG has facilities in the project area. Currently, SCG has two separate transmission gas lines within or adjacent to the project area. One of the gas lines extends through the project area on Irvine Boulevard. The other gas line is along Jeffrey Road south of the project area. (RGI Report)

Environmental Impacts

Based upon a natural gas consumption rate of 750 therms per year per unit for single-family and 475 therms per year per unit for multi-family, the proposed project (consisting of 12,350 units with a variety of single- and multi-family units) can be expected to consume between approximately 16,072 and 25,377 therms per day or 5.87 to 9.26 million therms annually. The proposed project also includes Multi-Use, Community Commercial, Commercial Recreation, Medical and Science, and Institutional land uses. Multi-Use, Community Commercial, Commercial Recreation, Medical and Science, and Institutional uses vary greatly in type and size; SCG does not compile generation rates for these type of land uses and therefore these rates are not included.[34] Gas service would be in accordance with the SCG's policies and extension rules on file with the California Public Utilities Commission at the time contractual arrangements are made.

The availability of natural gas service is based upon present conditions of gas supply and regulatory policies. SCG is under the jurisdiction of the California Public Utilities Commission, and can also be affected by actions of Federal regulatory agencies. Should these agencies take any action which affects gas supply or the condition under which service is available, gas service will be provided in accordance with the revised conditions[35].

SCG suggests the utilization of natural gas for space heating and other appropriate heating needs. SCG would need to extend gas lines that currently exist within the vicinity of the Northern Sphere Area at Jeffrey Road and Sand Canyon Avenue to serve the project area. New gas pipelines would be constructed within the street right-of-ways of existing and proposed streets. This would not create a significant impact on the environment.

Cumulative Impacts

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[34] *Personal conversation with Greg Heintz, Commercial Industrial Account Executive, Southern California Gas Company, January 19, 1999.*

[35] *Correspondence with Robert Warth, Technical Supervisor, The Gas Company, letter dated May 31, 2001.*

Cumulative development within the project area would increase natural gas consumption. Based upon present conditions of gas supply and regulatory policies, there are no significant impacts to gas services anticipated at this time.

Mitigation Measures

Existing Regulations and Standard Conditions

15.5 The project shall comply with City of Irvine and State of California insulation standards.

15.6 The project shall comply with all the State Energy Insulation Standards (Title 24) and City of Irvine codes in effect at the time of application for building permits.

15.7 The project landowner or subsequent project applicant shall consult with the Southern California Gas Company regarding feasible energy conservation measures.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to natural gas service impacts have been proposed.

Additional Mitigation Measures

15.8 The landowner shall consult with the Southern California Gas Company regarding feasible energy conservation measures and utilize measures to the maximum extent feasible.

Level of Significance after Mitigation

No significant impacts have been identified and no mitigation measures in addition to existing policies and standard conditions are required or recommended.

4.15.3 TELEPHONE SERVICE

Environmental Setting

The project site is located within the service area of Pacific Bell. Pacific Bell has existing telephone facilities within the project vicinity. Facilities exist near the intersection of Irvine Boulevard and Jeffrey Road and near Portola Parkway.

Environmental Impacts

To provide service to the proposed project, enhancement and/or extensions of existing facilities will be required. Pacific Bell will provide telephone service to the proposed project in accordance with, and at rates and charges specified in its scheduled tariffs on file with the California Public Utilities Commission. Service to the proposed project can be provided without any adverse impact on Pacific Bell's ability to provide telephone service in the area.[36] Conduit design will be provided by Pacific Bell once specific development plans become available.

Cumulative Impacts

Pacific Bell will be able to accommodate the needs for telephone service generated by this and other projects in the area. No adverse impacts on Pacific Bell's ability to service the area are anticipated.

Mitigation Measures

Existing Regulations and Standard Conditions

15.9 All telephone lines shall be located underground.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to telephone service impacts have been proposed.

Additional Mitigation Measures

No additional mitigation measures are required.

Level of Significance after Mitigation

[36] *Correspondence with Maryann Cassady, Right of Way Agent, Pacific Bell, August 2001.*

No significant impacts have been identified and no mitigation measures are required or recommended.

4.15.4 CABLE SERVICE

Environmental Setting

The project site is located within the service area of CoxCom, Inc. dba Communications Orange County, Inc. ("Cox"). Cox currently provides this service within the project vicinity. Currently, an existing 48 count fiber is located along Irvine Boulevard.

Environmental Impacts

The landowner will be responsible for installing the entire cable television distribution system (including prewires) according to a design and corresponding specifications to be provided by Cox. At the conclusion of the installation, a Cox project coordinator will inspect the system and activate the cable signal prior to building occupation. Development of the proposed project would require upgrading the fiber located along Irvine Boulevard and installing a new hub and one node for every 400 homes (approximately 31 node locations).

Cumulative Impacts

Cox will be able to accommodate the needs for cable service generated by this and other projects in the area.[37] No adverse impacts on Cox's ability to service the area are anticipated.

Mitigation Measures

Existing Regulations and Standard Conditions

The City of Irvine has no policies or standard conditions of approval related to cable television which apply to the proposed development of the Northern Sphere Area.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to cable service impacts have been proposed.

Additional Mitigation Measures

[37] *Correspondence from Linda Tessier, Business Development Coordinator, Cox Communications, letter dated July 25, 2001.*

No additional mitigation measures are required.

Level of Significance after Mitigation

No significant impacts have been identified and no mitigation measures are required or recommended.

4.15.5 WATER SERVICE

Environmental Setting

Water, reclaimed water, and wastewater services to the Northern Sphere Area is and will be provided by the Irvine Ranch Water District (IRWD). IRWD is a member agency of the Orange County Water District (OCWD).[38] Approximately 50% of the domestic water is obtained from local groundwater pumped from 16 wells within the Orange County Groundwater Basin.

The remaining 50% of potable demand is met from imported water supplied through the Metropolitan Water District of Southern California (MWD) via several large pipelines. MWD imports water from the Colorado River via the Colorado River Aqueduct and from Northern California via the California Aqueduct, also known as the State Water Project[39]. IRWD generally uses well water between April and October, and during the winter months the wells are shut off so the winter rains can help replenish the groundwater aquifer. From October through April, IRWD uses mostly imported water. Imported water is treated at MWD's Diemer Filtration Plant in Yorba Linda.[40] Due to cost and water quality considerations, IRWD intends to increase the use of local groundwater within the parameters set by OCWD and by agreement with other agencies.

The Water Resources Master Plan (updated 1/3/00) for IRWD is a comprehensive planning document that identifies existing and future planned water supply sources and demand within the IRWD. The Master Plan describes all existing water supply resources by category (e.g. ,imported, treated, untreated, reclaimed, potable and non-potable), the primary storage and delivery infrastructure (e.g., Allen-McColloch Pipeline, East Orange County Feeder No. 2) utilized to deliver water to the IRWD from MWD and throughout all regions of the IRWD, and plans to increase the supply of both non-potable and potable water supplies to meet projected future demand, including the identification of specific water projects that will contribute to the increased supply. For instance, the Master Plan describes the significant present reliance on imported water purchased from MWD (some 60% of the IRWD water supply comes from this source, chiefly from the Diemer Filtration Plant located north of Yorba Linda) and the plans to increase groundwater production to reduce reliance on imported water, primarily through increased production from the Dyer Road Well Field.

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38 *Correspondence with Richard Bell, P.E., District Manager, Irvine Ranch Water District, letter dated May 7, 2001.*

39 *Correspondence with Laura Simonek, Principal Environmental Specialist, MWD, letter dated June 5, 2001.*

40 *"Pipelines," The newsletter of the Irvine Ranch Water District, December 1997, vol.97, No. 12.*

The demand projections set forth in the Master Plan are periodically reviewed in relation to development projects identified in updated general plans adopted by the County of Orange and the several municipalities situated within the boundaries of the IRWD. The Master Plan provides for the development of additional clear and treated groundwater resources from the Main Orange County Groundwater Basin and the Irvine Sub-Basin through increased production, development of a deep water treatment system (DATS), the construction of the Irvine Desalter Project and the utilization of additional groundwater wells (rf. Section 4.4.3 of Master Plan). IRWD's capital budget includes allocations for the development of the foregoing resources. Additional water resources previously required to service demands of projects within the IRWD service area that have recently been reduced in size to a significant degree will be available to augment the demands of the project area. In addition, existing water wells currently devoted to agricultural uses in the vicinity of the project area may be utilized to service the water demands of the proposed project as agricultural uses decline.

Currently, the Northern Sphere Area consists of approximately 1,037 acres of irrigated row crops, 459 acres of orchards, and 799 acres of nurseries. Based on a water consumption rate of 3,100 gallons per day (gpd) for High-Irrigation (row crops) and 1,800 gpd for Low-Irrigation (orchards), the proposed project uses approximately 5,479,100 gpd of non-potable water.

IRWD is the agency responsible for the design, construction, operation, and maintenance of all "backbone" water facilities required to serve the Northern Sphere Area. Backbone facilities (IRWD Capital Facilities) are generally 12" or greater in size for water and wastewater; and 6" or greater in size for reclaimed water. Primary facilities such as reservoirs, pump stations, and pressure reducing stations are also usually considered backbone facilities. Facilities which are smaller than backbone facilities are generally designed/constructed by the developer/builder and then accepted by IRWD for operation and maintenance. The preliminary master plan for water service to the project area was prepared by RBF Consulting in October 2001 and is entitled "Northern Sphere Area Water and Wastewater Utility Plan," a copy of which is included in Appendix O.

Existing and proposed MWD facilities are located in the Northern Sphere Area. The Allen McColloch Pipeline traverses the proposed project in a generally northwest-southeast direction. The pipeline traverses Planning Area 6 through an area proposed for residential development. A second pipeline is planned adjacent to the existing pipeline within the Northern Sphere Area to increase the delivery capacity of treated water to southern Orange County. In addition, Metropolitan's approved Central Pool Augmentation (CPA) Project is planned for construction in the Northern Sphere Area. The CPA pipeline is proposed to run through Planning Area 3 to the Agua Chinon Wash. No development is proposed to occur in this area. The CPA Project is a new treated water delivery system consisting of a tunnel under the Santa Ana Mountains terminating in Agua Chinon Canyon and then continuing as an underground pipeline to join with the existing Allen McColloch Pipeline. These MWD facilities are not required to service the proposed project.

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on water supply if the project would:

- Require or result in the construction of new water facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

- Have insufficient water supplies available to serve the project from existing entitlements and resources, or would require new or expanded entitlements.

Project Impacts

The proposed project consists of 10,550 Medium Density dwelling units and 1,800 Medium-High Density dwelling units. Based on a water consumption rate of 310 gallons per day (gpd) for Medium Density Residential units and 180 gpd for Medium-High Residential units, the proposed Residential units can be expected to consume approximately 3,594,500 gpd (3.6 mgd) or 1.3 billion gallons per year (bgy). The proposed project also includes 575,000 s.f. of Multi-Use, 175,000 s.f. of Community Commercial uses, and 6,566,000 s.f. of Medical and Science uses, and 174-acres of community and neighborhood parks. Based on a water consumption rate of 60 gpd per thousand square feet of Multi-Use and Medical and Science use, 220 gpd per thousand square feet of Community Commercial use and 3,400 gallons per day (gpd) per acre for community and neighborhood parks, the proposed Multi-Use uses can be expected to consume approximately 34,500 gpd or 12.6 mgy, the Medical and Science uses can be expected to consume approximately 393,960 gpd or 143.8 mgy; the proposed Community Commercial uses can be expected to consume approximately 38,500 gpd or 14 mgy, and the proposed park uses can be expected to consume approximately 591,600 gpd or 215 mgy. Total water consumption for the proposed project is expected to be approximately 4.7 mgd and 1.7 bgy. It should be noted that parks, common areas and greenbelts are ordinarily served by recycled water. Therefore, approximately 1,482 mgy will be served by potable water and approximately 215 mgy will be served by recycled water.

The IRWD uses current general plans and zoning documents to determine future water demand projections. Although the City's General Plan assumes agricultural uses for the proposed development area, the 12,350 dwelling units proposed to be transferred to the Northern Sphere Area (see section 4.11 Population and Housing) have been assumed in the City's General Plan and therefore, these units were assumed for future water demand projections. In addition, IRWD recognizes that although agriculture has been pursued successfully in the region for many years, much of the agricultural land is now being converted to residential, commercial, industrial and other urban uses, and existing developed agricultural water supplies in the project area may be available for urban uses. In a letter dated November 15, 2001, IRWD concludes, based upon water supply information supplied to IRWD from MWD and MWDOC, as well as IRWD's ability to use local groundwater, that IRWD will have sufficient water supply to serve the project area. Its

determination that sufficient supplies will be available to meet demands under normal, single-dry and multiple-dry years was based upon water supply information provided in its and MWD's Urban Water Management Plan. As a result, no significant impacts related to water supply are anticipated.

For a large project such as the Northern Sphere Area, sizing and general locations of backbone and developer facilities are typically identified in a "Sub Area Master Plan" (SAMP) prepared by IRWD. Design of these facilities will be in accordance with all applicable IRWD criteria and will be sufficient to meet the projected service demands of the Northern Sphere Area development. Water service to the future development of the Northern Sphere Area is outlined in the IRWD 1991 Water Resources Master Plan and 1992 Sewer Collection System Master Plan.

Sizes and locations of potable water and reclaimed water facilities will be refined as part of the SAMP preparation, and periodic updates to the Water Resources Management Plan, Urban Water Management Plan, and applicable water assessment reports. Specific timing requirements for facilities have not yet been determined, although construction of domestic water, reclaimed water, and wastewater facilities will be prior to or concurrent with the development of each planning area within the Northern Sphere Area. Specifically, two (2) potable and two (2) non-potable water tanks are potentially required in the northern portion of Planning Area 6 (Implementation Area "R"). Potential impacts associated with these facilities are limited to aesthetics and biological impacts. With respect to aesthetics impact can be mitigated to a level of insignificance in that these facilities can be effectively screened from view by landscaping and berming. In some cases it is also possible to bury these tanks. Therefore with the imposition of Mitigation Measure 16.12 aesthetic impacts will be reduced to a level of insignificance. Relative to biological impacts, the proposed tanks are within areas covered by the NCCP/HCP. The NCCP/HCP was designed in contemplation of new water lines and pumping and storage facilities being installed within the NCCP Reserve to serve water needs in the area. (NCCP/HCP, Chapter 5.3, and Figure 28). Accordingly, the project is consistent with the NCCP, which reduces impacts to biological resources to a level of insignificance.

The primary source for domestic water supply is proposed to come from the existing 12-inch, 16-inch, 42-inch, and 48-inch water pipelines in Jeffrey Road, Irvine Boulevard, Trabuco Road, and Sand Canyon Avenue, respectively. In addition, a 16-inch pipeline runs along Portola Parkway. A network of pressure-reducing stations will be required to bring pressures down to acceptable ranges for respective development zones. Line sizes are projected to range from 10" to 16" for potable water and 4" to 12" for reclaimed water. The reclaimed water supply will be fed from existing 16-inch and 20-inch lines along Jeffrey Road.

Based on current IRWD policy, funding of the design and construction of "backbone" facilities is the responsibility of IRWD. Smaller facilities are typically the financial responsibility of the developer. IRWD's primary funding sources include property taxes, connection charges, and user fees.

As stated previously, MWD's Allen-McColloch Pipeline is located on the project site and MWD's CPA Project is proposed to be located within the project area. However, no structure will be constructed over the pipeline easements, although minor grading may occur within the easements per the written approval of MWD. As a result, this is not considered a significant impact.

Cumulative Impacts

IRWD supply and facilities planning is consistent with the general plans of the land use jurisdictions overlying IRWD. Consequently, presuming future development is generally consistent with existing general plans, IRWD does not anticipate any problems supplying water or wastewater service to any current or future development in the City of Irvine.[41]

Mitigation Measures

Existing Regulations and Standard Conditions

15.10 Prior to recordation of the first Final Tract Map ("A" Map), the landowner or subsequent project applicant shall coordinate with IRWD in the preparation of a "Sub Area Master Plan" (SAMP) which will identify sizing and general locations of IRWD Capital Facilities (wastewater) and developer facilities necessary to serve the proposed project with sewage collection and treatment systems with potable water and non-potable water supplies. Design of these facilities will be in accordance with all applicable IRWD criteria and will be sufficient to meet the projected service demands of the Northern Sphere Area development.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to water service impacts have been proposed.

[41] *Water Resources Master Plan, www.irwd.com.*

Additional Mitigation Measures

15.11 All tentative tract maps and/or parcel maps show all easements on the property. Any grading and/or construction within any easement shall be in conformance with the contractual agreements in effect between the landowner or subsequent project applicant and the easement holder.

15.12 Prior to the final approval of the location of potable and non-potable tanks proposed for Planning Area 6 (Implementation District "R") the landowner or subsequent project applicant shall submit to the Director of Community Development a landscape plan screening said tanks form public view through the use of landscape and berming consistent with the NCCP and subject to IRWD requirements. Alternatively, if feasible, said tanks may be placed underground.

Level of Significance after Mitigation

Implementation of the standard conditions of approval listed above will reduce all potential water impacts to a level of insignificance.

4.15.6 SEWER SERVICE

Environmental Setting

IRWD operates the Michelson Water Reclamation Plant (MWRP) located off Michelson Drive in the San Joaquin Marsh. The current capacity of MWRP is 15 million gallons per day (mgd) and planned capacity will reach 28 mgd. Flows are currently approaching 15 mgd. Consequently, IRWD is re-evaluating plans for MWRP expansion which is currently set for the year 2005. IRWD is a member of the County Sanitation Districts of Orange County (CSDOC) and is capable of conveying all sewage flows not treated at MWRP to CSDOC facilities in Fountain Valley for treatment and disposal.

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on sewer service if it results in any of the following:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

- Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

Project Impacts

According to the IRWD, the proposed project will generate wastewater at a rate of 200 gpd for each Medium Density unit, 164 gpd for each Medium-High Density unit, 1,900 gpd for each acre of Multi-Use and Community Commercial development, 4,500 gpd for each acre of Medical and Science development, and 100 gpd for each acre of community park. Based on these generation factors the proposed project is expected to increase wastewater flows by approximately 5,304,200 gallons per day or 1,936 million gallons per year. The IRWD has indicated that it has previously acquired adequate wastewater treatment and disposal capacity to serve the proposed project.[42] As a result, no significant impacts related to wastewater transport and treatment are anticipated.

Additional facilities are required to convey sewage from the Northern Sphere Area to either MWRP or CSDOC. The proposed wastewater collection system will consist of sanitary sewer facilities ranging in size from 8" to 15." Sizes and locations of wastewater facilities will be refined as part of the SAMP preparation. Specific timing requirements for facilities have not yet been determined, although construction of wastewater facilities will occur prior to or concurrent with the development of planning areas within the Northern Sphere Area. The planned expansion of MWRP or CSDOC will provide adequate capacity for the Northern Sphere Area.

Cumulative Impacts

IRWD wastewater treatment facilities planning is consistent with the general plans of the land use jurisdictions overlying IRWD. Consequently, presuming future development is generally consistent with existing general plans, IRWD does not anticipate problems in supplying wastewater service to any current and future development in the City of Irvine.

Mitigation Measures

Existing Regulations and Standard Conditions

15.13 Prior to recordation of the Final Map ("A" Map), the landowner or subsequent project applicant shall coordinate with IRWD in the preparation of a "Sub Area Master Plan" (SAMP) which will identify sizing and general locations of backbone and developer facilities

[42] *1992 Sewer Collection System Plan.*

necessary to serve the proposed project. Design of these facilities will be in accordance with all applicable IRWD criteria and will be sufficient to meet the projected service demands of the Northern Sphere Area development.

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to sewer service impacts have been proposed.

Additional Mitigation Measures

No additional mitigation measures are required.

Level of Significance after Mitigation

Implementation of the standard conditions of approval listed above will reduce all potential wastewater impacts to a level of insignificance.

4.15.7 SOLID WASTE DISPOSAL

Environmental Setting

All wastes generated within the City of Irvine are transported to one of three landfills operated by the Orange County Integrated Waste Management Department (IWMD). As shown on Table 4-100, the Orange County IWMD operates a total of three landfills; Frank R. Bowerman (FRB), Olinda Alpha, and Prima Deshecha. Frank R. Bowerman Landfill is located north of the proposed development area within Planning Area 3 of the Northern Sphere Area. A total of 4,627,640 tons of solid waste is disposed in these landfills annually.

Other solid waste facilities located in the County of Orange include six Transfer/Materials Recovery Facilities (MRF), four Household Hazardous Waste Collection Centers, and nine Composting Facilities. Facilities located within the City of Irvine include a Materials Recovery Facility (MRF) at Sunset Environmental Industries on Construction Circle West, a Household Hazardous Waste Collection Center at the Orange County Regional Collection Center on Oak Canyon Road, and a Composting Facility located on-site at Murai Farms on Laguna Canyon Road.

Table 4-100
Orange County Landfills

Landfill	Solid Waste Facilities Permit (SWFP) Issue Date	Permitted Tonnage (TPD)		Permitted Airspace (MCY)	Remaining Airspace as of 6-30-00 (MCY)	Cumulative Airspace Filled as of 6-30-00 (MCY)	Annual Refuse Filled 7-1-99 to 6-30-00 (Tons)	Remaining Refuse Tonnage as of 6-30-00 (Million Tons)
		Daily Max.	Daily Avg.					
Frank R. Bowerman	1996	8,500	7,263	117.0	84.1	32.9	2,005.021	42.23
Olinda Alpha	1996	8,000	7,000	123.1	57.6	65.5	1,929,341	31.98
Prima Deshecha	1995	4,000	4,000	108.0	90.1	17.9	693,278	45.06
Santiago Canyon	1994	4,900	4,900	26.0	2.3	23.7	0	1.15
Total		25,400	23,163	374.1	234.7	139.3	4,627,640	120.42

TPD = Tons Per Day MCY = Million Cubic Yards 1 CY Airspace = 0.6 Ton Refuse

Solid waste currently being generated at the project site includes greenwaste, pesticides, fertilizers, and other such waste produced by agriculture. The remainder of the site is undeveloped and does not currently generate any solid waste.

In September of 1989, in response to a state-wide problem of rapidly increasing solid waste and a limited amount of landfill sites to dispose of increasing waste volumes, the California Integrated Waste Management Act (AB 939) was signed into law. This Act required every California county and incorporated city to plan and implement programs designed to reduce the amount of solid waste disposed of at landfills by 50% by the year 2000. In March 1992, in compliance with guidelines set forth by AB 939, the City of Irvine adopted a Source Reduction and Recycling Element (SRRE) to define goals and objectives for waste reduction, recycling and diversion. The SRRE defines guidelines to implement these goals and objectives through eight main programs, consisting of Source Reduction, Recycling, Composting, Special Waste, Public Education Information, Disposal Facility Capacity, Funding, and Integration. According to the City's most recent annual status report to the California Integrated Waste Management Board, the City is 9.61 percent below this goal. In the last reporting year (1997), it was estimated that the total diversion rate in Irvine was 15.39 percent.[43]

The main components of the waste reduction section of the SRRE include: 1) Recycling Program including curbside, drop-off centers, buy-back centers, landfill salvage, multifamily, village

[43] *City of Irvine Annual Report to the California Integrated Waste Management Board, August 1, 1997.*

commercial (year 2000 diversion goal – 31.8%); 2) Greenwaste Composting including curbside, Multifamily, Village Commercial (year 2000 diversion goal – 7.15%); and 3) Source Reduction Component including variable can rate system, master composter, public education, City procurement policies and practices, and planning and reporting requirements (year 2000 diversion goal – 10.5%).

The curbside recycling program is one program implemented to reduce the City's solid waste stream (year 2000 diversion goal - 6.8%). Residential, Institutional, Commercial and Industrial solid waste is presently collected by private firms, with residential collections handled by Waste Management of Orange County, under a franchise agreement with the City of Irvine. In June, 1997 the City Council voted to grant a new 10-year contract to Waste Management to implement an enhanced recycling system capable of achieving the year 2000 mandate of 50% waste diversion from landfills. At this site recyclables are removed before non-recyclables are hauled to the landfill for disposal. Under the new contract Waste Management is required to evaluate options and recommend an improved recycling system. This new collection system was approved by the City Council on July 14, 1998. The new system (Automated Collection System) utilized automated collection vehicles to collect trash, commingled recyclables, and greenwaste from automated collection carts distributed to all residents with curbside waste service. The mix of materials collected for recycling has been expanded to included virtually all mixed household paper and residential greenwaste. This new program will significantly increase the amount of recyclables diverted from the landfill by expanding recycling for more diverse materials. The program also institutes an additional fee for people requesting extra containers for non-recyclable trash. The program is funded by a monthly per unit assessment on the taxpayer's property tax bill and the revenue generated from the sale of the recyclables.

A citywide ordinance provides provisions for program administration, enforcement, monitoring, non-compliance and penalties for the Institutional/Commercial/Industrial (I/C/I) recycling program. This program has a year 2000 reduction goal of 22.2% and is the most aggressive of the SRRE programs. Approximately 77% of Irvine waste is generated from these sources. This program requires I/C/I businesses to submit recycling program information including name of hauler/recycler, existing recycling programs, type of recycling programs, materials recycled and use of recycled products. Greenwaste recycling is another successful program. The City of Irvine actively encourages community landscapers to find alternatives to landfilling by working closely with independent landscapers, property managers and the City's contractor (year 2000 diversion goal - 4%). The collection of residential curbside greenwaste (year 2000 diversion goal - 2.5%) is part of the variable can rate system (Automated Collection System). The variable can rate system requires residents to pay extra for additional trash bins while offering additional recycling bins at no extra charge (year 2000 diversion goal - 7%).

The County of Orange operates a Household Hazardous Waste Collection Center at 6411 Oak Canyon Road, near Sand Canyon Avenue. State transportation laws limit the amount of hazardous waste per vehicle to 15 gallons or 125 pounds per visit.

Trash is a commodity in today's economy and may be taken to any landfill facility that is properly licensed and permitted to receive such waste. Nevertheless, Irvine's solid wastes that cannot be diverted from landfills are taken to the Frank R. Bowerman landfill (FRB), a County of Orange facility located within Planning Area 3, near Portola Parkway and the Eastern Transportation Corridor (SR-133). FRB was formerly named Bee Canyon Landfill, because of its location in Bee Canyon. The City of Irvine is under contract to the County of Orange Integrated Waste Management Department to commit all of its non-recyclable waste to FRB until the year 2007 at which time a contract renewal is expected, but not guaranteed. FRB serves the County's Central Region, composed of the communities of central Orange County, including Westminster, Fountain Valley, Santa Ana, Tustin, Huntington Beach, Costa Mesa, Newport Beach, Laguna Beach, Lake Forest, Irvine, and the unincorporated areas east of these cities. FRB is authorized to accept only non-hazardous municipal solid wastes. For 1999, the quantity of waste disposed at FRB must not exceed an annual average of 7,263 tons per day. FRB is currently receiving an average of 6,531 tons per day. This average cap is adjusted upward at a rate of 1.75% per year to a maximum annual average of 8,500 tons per day in accordance with the Settlement Agreement between the County and the City of Irvine. The total permitted capacity of FRB is 117.0 million cubic yards (mcy), of which 32.9 mcy has been used. This landfill is projected to close in the year 2024.[44]

Environmental Impacts

Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact on solid waste services if:

- The project will be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.
- The project does not comply with federal, state, and local statutes and regulations related to solid waste.

The project would result in a significant impact to waste disposal services if it would substantially increase the demand for such services to the extent that it would require new or altered disposal facilities not presently available. Project impacts would also be considered significant if it would increase the demand for waste disposal services beyond the ability of the IWMD to provide locations for waste disposal, or if it would conflict with the City's solid waste reduction obligations under AB 939.

Project Impacts

[44] *Correspondence with Robert Richmond, Planner IV, Regulatory Compliance, IWMD, letter dated January 10, 2000.*

Development of the proposed project buildout of 12,350 homes would increase the service demand on solid waste disposal beyond existing conditions and further impact the FRB landfill and the City's solid waste reduction and diversion programs. The estimated project site population is 34,843,[45] and the average solid waste generated per person in Orange County is approximately 9.8 pounds per day.[46] Therefore, total waste generation from the proposed project site is estimated to be approximately 341,461 pounds or 170.4 tons per day.[47] The estimated 170.4 of project waste requiring disposal daily represents approximately 3% of the current total daily FRB disposal amount. This amount would increase the total daily inflow to FRB to approximately 6,701, which is within its 7,263 permitted daily limit. No significant impacts to FRB or the IWMD's other landfills are therefore expected to result from this project provided that the mitigation measures listed below are incorporated into the proposed project.

The proposed residential uses are expected to generate the typical range of recyclable and nonrecyclable waste that other such uses create, including greenwaste (i.e. lawn and tree trimmings), cardboard, paper, glass, plastic, aluminum cans, diapers, food, and household hazardous waste (i.e. paint, motor oil, antifreeze, batteries), etc.

The total solid waste generated by the project site (62,196 tons/year) would increase the total volume generated by the City of Irvine (330,967 tons/year)[48] by approximately 19% percent. This increase in city-wide solid wastes would not be considered a significant impact, but it would conflict with the City's solid waste diversion goals under AB 939. However, existing City programs would achieve recycling, re-use or other diversion of approximately 23 percent of the project's residential non-hazardous wastes, based on current residential diversion rates. This would divert approximately 14,305 tons per year and result in a net landfill disposal volume of roughly 47,891 tons per year, throughout the active life of the residential community within the Northern Sphere Area. Without an effective solid waste reduction program, development and occupancy of 12,350 new dwelling units in the Northern Sphere Area would result in a significant impact on the City of Irvine's solid waste management program, pursuant to AB 939. Those wastes that can be recycled or reused will help sustain the use of Materials Recovery Facilities, composting facilities and other facilities that are operated specifically to divert wastes from landfills. Household hazardous wastes volumes are very difficult to estimate and no reliable generation factors are known to be available.

Cumulative Impacts

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45 *See Table 4-52 in Section 4.11 Population and Housing for calculations of estimated project population.*

46 *The County of Orange estimates the generation of solid waste per person per day based on total County population and total wastes produced within the County. The amount of solid waste generated is produced by all land uses within the County, including Commercial, Industrial, Medical and Science, and Residential uses.*

47 *Countywide projection using a 1990 baseline year. Personal communication with Sue Gordon and Bob Richmond, Integrated Waste Management Department, May 20, 1998.*

48 *City of Irvine, 1997 Annual Report to the California Integrated Waste Management Board, January 10, 1999.*

According to IWMD, the daily tonnage capacity limits at FRB are not expected to be exceeded by the daily solid waste disposal requirements of the Central Region wasteshed for the foreseeable future. Currently FRB is accepting additional waste from outside Orange County. Under these circumstances, should the cumulative effect of development in the Central Region wasteshed cause the daily tonnage ceiling to be exceeded, the waste being imported will be reduced by an amount sufficient to stay within tonnage limits.

The California Integrated Waste Management Board requires that all counties have an approved Countywide Integrated Waste Management Plan (CIWMP). To be approved, the CIWMP must demonstrate sufficient solid waste disposal capacity for at least 15 years, or identify additional available capacity outside the County's jurisdiction. Orange County's CIWMP, approved in 1995, estimates future solid waste disposal demand based on countywide population projections adopted by the Board of Supervisors. IWMD's database estimates that the Orange County landfill system has capacity in excess of 30 years; therefore, no significant cumulative solid waste impacts are anticipated. Continuation of local government efforts required under AB 939 to divert wastes from the County's landfills will also reduce the magnitude of cumulative impacts. This project's solid waste generation is included in the IWMD estimates of long-term, countywide solid waste generation, based on the Irvine General Plan land use designations for the project site. Since this project is consistent with those designations, this project's portion of the long-term, cumulative solid waste stream countywide would not be significant from a statistical standpoint. However, if future development within the Northern Sphere Area does not include measures to reduce the amount of waste requiring landfill disposal, the project's contribution to cumulative solid wastes would be considered significant.

Mitigation Measures

Existing Regulations and Standard Conditions

15.14 Prior to the issuance of precise grading permits for multi-family or single-family attached projects, the landowner or subsequent project applicant shall show on the site plans the location of receptacles to accumulate on-site generated solid waste for recycling purposes.

15.15 Tentative subdivision map and master plan applications for attached residential projects shall satisfy the refuse collection and recyclable materials collection and loading standards set forth in Section 3-25-1 (Refuse collection Standards, Recycling Collection Standards) of the Irvine Municipal Code. These sections establish standards for the capacity, location, design and maintenance of refuse and recycling collection bins.

15.16 This project will result in new construction which will generate solid waste. Prior to the issuance of precise grading permits, the landowner or subsequent project applicant shall show on the site plans the location of receptacle(s) to accumulate on-site generated solid waste for recycling purposes. At the discretion of the Director of Community Development

the developer of the nonresidential project may be permitted to contract with a waste recycler for off-site materials recovery. In this case the landowner or subsequent project applicant must provide a letter verifying that recycling will be conducted off site in an acceptable manner. (Standard Condition A.12)

Project Design Features/Special Development Requirements

No project design features or special development requirements relating to solid waste disposal impacts have been proposed.

Additional Mitigation Measures

No additional mitigation measures are required.

Level of Significance after Mitigation

Implementation of the standard conditions of approval and mitigation measures listed above will reduce all potential solid waste impacts to a level of insignificance.