

APPENDIX A **Circulation and  
Mobility Appendix**



# APPENDIX A **Circulation and Mobility Appendix**

This appendix of the Laguna Niguel Gateway Specific Plan describes:

1. Land use, future traffic volumes, and their distribution
2. Circulation and mobility facilities and their operations

## **Land Use and Trip Generation**

The future transportation needs for the Specific Plan area were in part based on the future volumes of traffic projected for the plan land uses and other development in the region. The traffic projections were developed using the proposed Land Use Plan and the latest version of the South County Sub-Area Traffic Model for Laguna Niguel, operated and maintained by Austin, Foust Associates, Inc. The model projected operating conditions for the year 2035 and assigned traffic to the area street network based on the network assumptions for the area. The model assumptions include:

- Buildout of Ladera Ranch and the approved Ranch Plan including a set of intersection improvements that were approved as a condition of development for the Ranch Plan that are now part of the SCRIP improvements
- Mission Hospital expansion
- La Pata Avenue extension between SR-74 and Avenida La Pata terminus north of Avenida Vista Hermosa
- No Foothill Transportation Corridor-South corridor extension

The Saddleback Connector ramps are not included in the base analysis even though they were identified as part of the mitigation program for the Ladera Ranch development because the ramps are speculative and were listed in the OCTA South County MIS as “to be studied further.”

The year 2035 model runs used General Plan land use for the cities of Mission Viejo, San Juan Capistrano, Laguna Niguel, Dana Point, and San Clemente and the approved land use plan for Ladera Ranch.

The network assumes a committed circulation system (i.e., improvements that are included in a capital improvement program or projects that are currently funded by Caltrans) plus those improvements that are funded conditions of approval for

development. Also included are regional and local improvements that have a reasonable assurance of being built prior to the year 2035 by a specific funding source.

The number of trips generated by the proposed Land Use Plan is based on trip rates and distributions embedded in the traffic model. These take into account the proximity of other land uses in the area and the interactions between mixed-use developments conceived for some sites within the Specific Plan area. The trips projected for the Specific Plan Land Use Plan are listed in Table A-1 (Land Use and Trip Generation Summary—Gateway Specific Plan).

Land Use Type	Amount	Units	AM Peak Hour			PM Peak Hour			ADT
			In	Out	Total	In	Out	Total	
Single Family Attached	2,994	du	389	1,498	1,887	1,586	840	2,426	24,251
General Commercial	407.65	tsf	258	162	420	734	790	1,524	17,497
Light Manufacturing/ Business Park	323.21	tsf	236	52	288	61	236	297	2,250
General Office	730.6	tsf	1,001	138	1,139	182	906	1,088	8,045
Medical Office	410.42	tsf	796	201	997	406	1,096	1,502	14,828
Auto Sales-New	17.78	acre	187	80	267	170	256	426	5,334
Hotel	200	room	68	44	112	64	58	122	1,646
Wholesale	124.07	tsf	62	19	81	231	241	472	5,186
Metrolink Transit	1,200	pksp	396	180	576	216	300	516	4,440
<b>Total</b>			<b>3,393</b>	<b>2,374</b>	<b>5,767</b>	<b>3,650</b>	<b>4,723</b>	<b>8,373</b>	<b>83,477</b>

du = dwelling unit; tsf = total square feet; pksp = parking space

## Circulation and Mobility Facilities and Operations

To evaluate future operations, 21 intersections and 20 roadway segments were chosen for analysis. The analysis included both standard volume-to-capacity (V/C) analyses and a microsimulation analysis of the arterial roadways to derive a more detailed analysis of corridor operations. The analyzed intersections are as follows:

- Avery Parkway/Marguerite Parkway
- Avery Parkway/I-5 Ramps (2)
- Avery Parkway/Camino Capistrano

- Crown Valley Parkway/Marguerite Parkway
- Crown Valley Parkway/ Bellogente
- Crown Valley Parkway/Los Altos
- Crown Valley Parkway/Medical Center
- Crown Valley Parkway/Puerta Real
- Crown Valley Parkway/Kaleidoscope
- Crown Valley Parkway/I-5 Ramps (2)
- Crown Valley Parkway/Forbes Road
- Crown Valley Parkway/Cabot Road
- Crown Valley Parkway/Greenfield Drive
- Crown Valley Parkway/Moulton Parkway (Golden Lantern)
- Paseo De Colinas/Camino Capistrano
- Paseo De Colinas/Cabot Road
- Greenfield Drive/SR-73 Ramps (2)
- Rapid Falls Road/Cabot Road

## **A. INTERSECTION AND ROADWAY OPERATING CONDITIONS**

Existing intersection operating conditions were quantified using the Intersection Capacity Utilization (ICU) methodology, which compares the volume of traffic through an intersection as a ratio to the volume capacity of the intersection. This approach was used for the analysis in order to provide a comparison to previous ICU traffic analysis efforts in the area. To provide a more detailed analysis of traffic operations, a microsimulation analysis model was also developed for the Specific Plan area. This simulation analysis methodology allows for more accurate analysis of the interactions between the closely spaced intersections in the area because it incorporates more detailed characteristics of intersection operations and allows for evaluation of vehicle progression, queuing and storage conditions, as well as potential issues related to conflicts of passenger vehicles and buses.

### **Traffic Operations**

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The traffic analysis indicated that at project build-out, without construction of some additional roadway and intersection travel lanes, five intersections evaluated in the analysis would operate at a

poor level of service (LOS) during one or more of the commute peak hours based on the Intersection Capacity Utilization (ICU) used by the City to determine operating conditions. The ICU methodology uses volume-to-capacity (V/C) ratios to quantify operating conditions. The three intersections projected to have poor LOS' are:

- Marguerite Parkway and Avery Parkway
- Marguerite Parkway and Crown Valley Parkway
- Crown Valley Parkway and Los Altos
- Crown Valley Parkway and Medical Center Drive
- I-5 Southbound Ramps and Crown Valley Parkway

While the ICU methodology does not show any poor operating conditions during the AM peak hour, it should be noted that the I-5 Southbound Ramps and Crown Valley Parkway intersection is very congested during the morning commute peak hour and that queuing between intersections at the I-5 ramp impedes movement during the hour and limits capacity of the interchange.

As part of corridor improvements along Crown Valley Parkway and Cabot Road, additional through and turn lanes will be provided at the intersections of Crown Valley Parkway with Cabot Road, Forbes Road, and the I-5 Southbound Ramps. While the proposed changes at the I-5 Southbound Ramps and Crown Valley Parkway intersection will improve traffic operations along the Crown Valley Parkway corridor, the changes will not affect the V/C results for that intersection. Ultimately, with the redesign of the I-5/Crown Valley Parkway interchange the poor operation conditions at the I-5 ramp intersections can be improved.

No improvements are proposed for the four intersections along Marguerite Parkway and Crown Valley Parkway, in Mission Viejo. Therefore, the intersections are anticipated to operate at a poor LOS in the future under the cumulative conditions with the buildout of all the area land uses. Long term strategies for addressing the Specific Plan's contribution to future operating conditions and improving operations at the Avery Parkway intersections will need to be identified in cooperation with the City of Mission Viejo.

### **Roadway Segment Analysis**

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An analysis of the daily operating conditions for selected roadway segments in the Specific Plan area for Year 2010 show that portions of Crown Valley Parkway and Avery Parkway are currently operating

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at less than acceptable conditions on a daily basis. Those portions are:

- Crown Valley Parkway—Cabot Road to I-5 SB Ramps
- Avery Parkway—I-5 NB Ramps to Marguerite Parkway

With buildout of the Land Use Plan the portions of those corridors operating poorly increases. The poorly operating sections include:

- Crown Valley Parkway—Greenfield Drive to Cabot Road
- Crown Valley Parkway—I-5 Northbound Ramps to Puerta Real
- Avery Parkway—Camino Capistrano to Marguerite Parkway

With the proposed widening of Crown Valley Parkway to eight lanes between I-5 and Cabot Road, and the addition of a fourth eastbound lane west of Cabot, the operating conditions on Crown Valley Parkway west of Forbes Road are projected to improve to acceptable conditions. A portion of the need to widen Crown Valley parkway west of Cabot Road is a result of traffic from the Gateway area that will be using Crown Valley Parkway. Therefore, a share of that ultimate improvement may be attributable to development within the Specific Plan area.

No feasible corridor improvements have been identified at this time to address future conditions along the Avery Parkway corridor or Crown Valley Parkway corridor east of I-5. Part of the increase in future traffic volumes along these corridors is attributable to development in the Specific Plan area. Therefore, a share of some ultimate improvement of these segments may be attributable to development within the Specific Plan area.

### **Microsimulation Analysis**

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The intersection analyses along the Crown Valley Parkway corridor show that the intersections are projected to have acceptable operating conditions in the future having V/C with good LOSs, while the roadway segments would have poor LOSs. These differences along with the closely spaced traffic signals along the corridor indicate that coordination issues can significantly affect traffic operations and that potential capacity at some intersections may not be usable because of mid-block congestion and queuing at upstream and/or downstream intersections.

To better evaluate corridor conditions a microsimulation analysis was conducted using the Synchro program. Synchro allows for the modeling of traffic operations along arterial roadways to determine

the impact factors such as traffic signal timing and coordination, and driver behaviors such as lane changing, have on operations. The results of the Synchro analysis showed that the intersection can operate at acceptable levels of service if the traffic signals along the corridor are coordinated and operate as a cohesive system. It also confirmed the need for long-term improvements at the Crown Valley Parkway and I-5 interchange, because the current tight-diamond design will not accommodate future traffic volumes.