

5.14 Transportation

5.14.1 INTRODUCTION

This section describes the existing transportation and circulation conditions, criteria for the level of service, and impacts from implementation of the proposed Project. As necessary, mitigation measures for significant transportation impacts resulting from the construction and operation of the proposed Project are also included. The proposed Project's impacts are analyzed in the context of existing (2019), Project opening (2022), and future (2040) conditions. This analysis is based on information contained in the Traffic Impact Analysis (TIA 2019), which is included as Appendix K.

Traffic Analysis Terminology

Level of Service (LOS): is a measure of the quality of operational conditions within a traffic stream and is generally expressed in terms of such measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. Levels range from A to F, with LOS A representing excellent (free-flow) conditions and LOS F representing extreme congestion.

Peak Hour: The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 a.m. and 9:00 a.m. The p.m. peak hour is defined as the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m.

Volume/Capacity (V/C) Ratio: is one of the most used index to assess traffic status in cities, in which V is the total number of vehicles passing a point in one hour and C for the maximum number of cars that can pass a certain point at the reasonable traffic condition

5.14.2 REGULATORY SETTING

Congestion Management Program

In 1990, the California Legislature enacted the Congestion Management Program (CMP) to implement Proposition 111, a state-wide transportation funding proposal that required local governments to implement mitigation measures to offset the impacts from new development on the regional transportation system. The CMP addresses the impact of local growth on the regional transportation system; the goal is to examine the interactions among land use, transportation, and air quality and to make decisions at the regional and local level in consideration of these interactions.

When LOS requirements are not maintained on portions of the CMP highway and roadway system, a deficiency plan is required that analyzes the cause of the deficiency and the implementation costs of various alternatives such as roadway modifications, programs, or actions to measurably improve performance. Highways must maintain at least LOS E, which is essentially one grade better than gridlock and is defined by a level of service where traffic flow fluctuates in terms of speed and flow rates, operating speeds average 35 miles per hour, and delays are significant. For arterial streets, LOS E occurs where long queues of vehicles are waiting upstream of an intersection and it may take several signal cycles for a vehicle to clear the intersection. A jurisdiction failing to comply with the CMP may have its allocation of the state gas tax withheld.

Senate Bill 743

On September 27, 2013, Senate Bill (SB) 743 was signed into State law. The California legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the state had signaled its commitment to encourage land use and transportation planning decisions and

investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of greenhouse gas (GHG) emissions, as required by the California Global Warming Solutions Act of 2006 (AB 32).

SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include the elimination of auto delay, LOS, and similar measures of vehicular capacity or traffic congestion as the basis for determining significant impacts in many parts of California (if not statewide). As part of the new CEQA Guidelines, the new criteria “shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses” (Public Resources Code Section 21099[b][1]). On January 20, 2016, the Governor’s Office of Planning and Research released revisions to its proposed CEQA guidelines for the implementation of SB 743. Final review and rulemaking for the new guidelines are ongoing. Once the guidelines are prepared and certified, “automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment” (Public Resources Code Section 21099[b][2]). Since the Governor’s Office of Planning and Research has not yet amended the CEQA Guidelines to implement this change, automobile delay is still considered a significant impact, and the City of Santa Ana continues to use the established LOS criteria.

SCAG 2016 - 2040 Regional Transportation Plan/Sustainable Communities Strategy

On April 7, 2016 SCAG’s Regional Council adopted the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS) and the goals and policies relevant to the proposed project are listed below:

Goals

1. Align the plan investments and policies with improving regional economic development and competitiveness.
2. Maximize mobility and accessibility for all people and goods in the region.
3. Ensure travel safety and reliability for all people and goods in the region.
4. Preserve and ensure a sustainable regional transportation system.
5. Maximize the productivity of our transportation system.
6. Protect the environment and health of our residents by improving air quality and encouraging active transportation (e.g., bicycling and walking).
7. Actively encourage and create incentives for energy efficiency, where possible.
8. Encourage land use and growth patterns that facilitate transit and active transportation.

Orange County Congestion Management Plan

The Orange County CMP was established in 1991 to reduce traffic congestion and to provide a mechanism for coordinating land use and development decisions. Compliance with the CMP requirements ensures a city’s eligibility to compete for the State gas tax funds for local transportation projects. The Orange County CMP is implemented by the Orange County Transportation Authority (OCTA).

As part of the CMP, a CMP Highway Network was identified for Orange County that consists of Orange County’s State highway system, and highway and arterials from OCTA’s Smart Street network. OCTA has implemented an Intersection Capacity Utilization (ICU) monitoring method, developed with technical staff members from local and State agencies, for measuring the LOS at CMP Highway System (CMPHS) intersections. The CMP requires analysis of off-site intersections potentially affected by the project, which the CMP defines as intersections at which the project is forecast to add 51 or more peak hour trips. The CMP also requires the analysis of freeway segments and ramp merge/diverge areas where a project is forecast to add more than 100 two-way trips.

City of Santa Ana General Plan

Circulation Element

The City is currently undergoing a comprehensive update to the General Plan. The Circulation Element of the Santa Ana General Plan serves as the City's primary guide for transportation planning. The following goals and policies in the existing General Plan Circulation Element are relevant to the proposed Project:

- Goal 1:** Provide and maintain a comprehensive circulation system that facilitates the efficient movement of people and goods throughout the City and enhances its economic viability.
- Policy 1.4:** Maintain at least a level of service "D" on arterial street intersections, except in major development areas.
- Policy 1.11:** Minimize travel impediments on bicycle and pedestrian paths.
- Goal 2:** Provide design and construction that facilitates safe utilization of the City's transportation systems.
- Policy 2.1:** Limit the number of driveways on arterial streets to reduce vehicular conflict and facilitate traffic flow.
- Goal 3:** Provide a full spectrum of travel alternatives for the community's residents, employees, and visitors.
- Policy 3.4:** Encourage the development of multi-modal transit opportunities within major development areas.
- Policy 3.5:** Enhance sidewalks and pedestrian systems to promote their use as a means of travel.
- Goal 4:** Fully coordinate transportation and land use planning activities.
- Policy 4.2:** Assess land use and transportation project impacts through the development review process.
- Policy 4.3:** Assess all development projects in order to identify their traffic impacts and require that they pay their fair-share of the system improvements necessary to accommodate traffic generated by the project.
- Goal 5:** Create attractive circulation corridors to enhance the City's image.
- Policy 6.1:** Implement street design features that discourage through traffic on residential streets.

5.14.3 ENVIRONMENTAL SETTING

Traffic Study Area and Existing Levels of Service

Access to the Project site is provided by Red Hill Avenue and Warner Avenue. Red Hill Avenue is a 7-lane divided north-south arterial roadway adjacent to the Project site that has a speed limit of 50 mph, and 45 mph north of Valencia Avenue. Red Hill Avenue connects to Interstate 405 (I-405) to the south and Interstate 5 (I-5) to the north. Warner Avenue is a 6-lane divided east-west arterial roadway that has a speed limit of 45 mph west of Red Hill Avenue and 50 mph east of Red Hill Avenue.

The traffic study area for the proposed Project, as determined through coordination with the Cities of Santa Ana, Irvine, and Tustin includes 57 intersections, which are listed in Tables 5.14-1 and shown in Figure 5.14-1. The existing traffic volumes for intersections based on peak hour intersection turn movement counts and daily counts collected in April and May 2019. Table 5.14-1 shows that all study area intersections are currently operating at acceptable levels of service.

Table 5.14-1: Existing Intersection Levels of Service

	Intersection	City	Signal Control	AM Peak		PM Peak	
				V/C or Delay	LOS	V/C or Delay	LOS
1.	Grand Ave./Edinger Ave.	Santa Ana	Signal	0.710	C	0.843	D
2.	Grand Ave./St. Andrew Pl.	Santa Ana	Signal	0.349	A	0.506	A
3.	Grand Ave./St. Gertrude Pl.	Santa Ana	Signal	0.407	A	0.484	A
4.	Grand Ave./Warner Ave.	Santa Ana	Signal	0.549	A	0.716	C
5.	Grand Ave./SR 55 SB Off-Ramp	Santa Ana	Signal	0.486	A	0.509	A
6.	SR 55 SB Ramps/Dyer Rd.	Santa Ana	Signal	0.663	B	0.739	C
7.	Grand Ave./Dyer Rd.	Santa Ana	Signal	0.585	A	0.622	B
8.	SR 55 NB Ramps/Dyer Rd.	Santa Ana	Signal	0.562	A	0.389	A
9.	Wright St./Warner Ave.	Santa Ana	Signal	0.398	A	0.646	B
10.	Pullman St./Warner Ave.	Santa Ana /Tustin	Signal	0.335	A	0.434	A
11.	Pullman St./Dyer Rd.	Santa Ana	Signal	0.467	A	0.702	C
12.	SR 55 SB Ramps/Edinger Ave.	Santa Ana	Signal	0.600	A	0.591	A
13.	Newport Ave./Edinger Ave.	Tustin	Signal	0.645	B	0.357	A
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Tustin	Signal	0.461	A	0.613	B
15.	Newport Ave./Valencia Ave.	Tustin	Signal	0.147	A	0.306	A
16.	Red Hill Ave./El Camino Real	Tustin	Signal	0.610	B	0.534	A
17.	Red Hill Ave./Interstate 5 NB Ramps	Tustin	Signal	0.618	B	0.582	A
18.	Red Hill Ave./Interstate 5 SB Ramps	Tustin	Signal	0.724	C	0.666	B
19.	Red Hill Ave./Nissan Rd.	Tustin	Signal	0.561	A	0.606	B
20.	Red Hill Ave./Mitchell Ave.	Tustin	Signal	0.529	A	0.509	A
21.	Red Hill Ave./Walnut Ave.	Tustin	Signal	0.590	A	0.684	B
22.	Red Hill Ave./Edinger Ave.	Tustin	Signal	0.500	A	0.760	C
23.	Red Hill Ave./Valencia Ave.	Tustin	Signal	0.471	A	0.441	A
24.	Red Hill Ave./Victory Rd.	Tustin	Signal	0.357	A	0.409	A
25.	Red Hill Ave./Warner Ave.	Santa Ana /Tustin	Signal	0.500	A	0.567	A
26.	Driveway 1/Warner Ave.	Santa Ana	Signal	-	-	-	-
27.	Driveway 2/Warner Ave.	Santa Ana	TWSC	-	-	-	-
28.	Red Hill Ave./Driveway 3	Santa Ana	TWSC	-	-	-	-
29.	Red Hill Ave./Carnegie Ave.	Santa Ana /Tustin	Signal	0.334	A	0.382	A
30.	Red Hill Ave./Barranca Pkwy.	Santa Ana /Tustin/Irvine	Signal	0.564	A	0.785	C
31.	Red Hill Ave./Deere Ave.	Santa Ana /Irvine	Signal	0.410	A	0.699	B
32.	Red Hill Ave./Alton Pkwy.	Santa Ana /Irvine	Signal	0.489	A	0.833	D
33.	Red Hill Ave./McGaw Ave.	Irvine	Signal	0.462	A	0.719	C
34.	Red Hill Ave./MacArthur Blvd.	Irvine	Signal	0.604	B	0.762	C
35.	Halladay St. E/Alton Ave.	Santa Ana	TWSC	10.5	B	9.9	A
36.	Halladay St. W/Alton Ave.	Santa Ana	TWSC	12.2	B	11.6	B
37.	Daimler St./Alton Pkwy.	Santa Ana /Irvine	AWSC	9.9	A	10.6	B
38.	MacArthur Blvd./Sky Park East	Irvine	Signal	0.328	A	0.503	A
39.	MacArthur Blvd./Main St.	Irvine	Signal	0.533	A	0.696	B
40.	MacArthur Blvd./Interstate 405 NB Ramps	Irvine	Signal	0.759	C	0.696	B
41.	MacArthur Blvd./Interstate 405 SB Ramps	Irvine	Signal	0.533	A	0.643	B

	Intersection	City	Signal Control	AM Peak		PM Peak	
				V/C or Delay	LOS	V/C or Delay	LOS
42.	Reserve Center Driveway/Warner Ave.	Tustin	Signal	0.122	A	0.183	A
43.	Armstrong Ave./Warner Ave.	Tustin	Signal	0.153	A	0.196	A
44.	Armstrong Ave./Barranca Pkwy.	Tustin/Irvine	Signal	0.433	A	0.681	B
45.	Legacy Rd./Warner Ave.	Tustin	Signal	0.103	A	0.188	A
46.	Tustin Ranch Rd./Valencia Ave.	Tustin	Signal	0.465	A	0.493	A
47.	Tustin Ranch Rd./Warner Ave. N	Tustin	Signal	0.365	A	0.659	B
48.	Tustin Ranch Rd./Warner Ave. S	Tustin	Signal	0.386	A	0.543	A
49.	Tustin Ranch Rd./Park Ave.	Tustin	Signal	0.515	A	0.663	B
50.	Tustin Ranch Rd./Barranca Pkwy.	Tustin/Irvine	Signal	0.711	C	0.819	D
51.	Von Karman Ave./Alton Pkwy.	Irvine	Signal	0.676	B	0.819	D
52.	Park Ave./Warner Ave.	Tustin/Irvine	Signal	0.449	A	0.693	B
53.	Millikan Ave./Barranca Pkwy.	Tustin/Irvine	Signal	0.436	A	0.632	B
54.	Jamboree Rd./Barranca Pkwy.	Tustin/Irvine	Signal	0.760	C	0.904	E
55.	Jamboree Rd./Alton Pkwy.	Irvine	Signal	0.721	C	0.806	D
56.	Jamboree Rd./Main St.	Irvine	Signal	0.754	C	0.800	C
57.	Corporate Park/Barranca Pkwy.	Irvine	Signal	0.333	A	0.549	A

Caltrans Analysis

	Intersection	Signal Control	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	11.8	B	14.1	B
6.	SR 55 SB Ramps/Dyer Rd.	Signal	41.5	D	42.5	D
8.	SR 55 NB Ramps/Dyer Rd.	Signal	21.8	C	15.2	B
12.	SR 55 SB Ramps/Edinger Ave.	Signal	37.5	D	41.9	D
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	30.4	C	38.0	D
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	25.5	C	21.5	C
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	41.8	D	34.1	C
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	33.9	C	20.5	C
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	25.1	C	25.5	C

Source: Appendix K.

TWSC = Two-Way Stop Controlled (evaluated using the HCM Methodology)

AWSC = All-Way Stop Controlled (evaluated using the HCM Methodology)

¹ Volume to Capacity Ratio for Signalized Intersections using ICU methodology. Delay for signalized Caltrans intersections or unsignalized intersections.

² Level of Service

³ Seconds of control delay

Existing Transit Service

The Project site is currently served by Orange County Transportation Authority (OCTA) Bus Routes 71 (Red Hill) and 72 (Warner), as well as Metrolink Stationlink Route 472 (Red Hill). Bus routes 71 and 72 provide service seven days a week. Route 472 provides service Monday thru Friday. Other Bus Routes servicing areas within the Project area are OCTA bus routes 55, 59, 70, 76, 86, Intracounty OC Express Route 213/A, Metrolink Stationlink Route 463, and the IShuttle 400A, 401B, and 405F.

Existing Bicycle and Pedestrian Facilities

There are several roadways in the Project vicinity that currently have bicycle lanes, which include:

- Red Hill Avenue between Barranca Parkway and Reynolds Avenue,
- Warner Avenue east of Red Hill Avenue,

- Tustin Ranch Road,
- Von Karman Avenue,
- Jamboree Road between Barranca Parkway and Main Street,
- Edinger Avenue between Red Hill Avenue and Newport Avenue,
- South side of Barranca Parkway west of Jamboree Road,
- Alton Parkway between Red Hill Avenue and Jamboree Road, and
- Main Street.

Additionally, sidewalks currently exist adjacent to the site along both Red Hill Avenue and Warner Avenue.

5.14.4 THRESHOLDS OF SIGNIFICANCE

Appendix G of State CEQA Guidelines indicates that a project could have a significant effect if it were to:

- | | |
|------|--|
| TR-1 | Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities; |
| TR-2 | Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b); |
| TR-3 | Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or |
| TR-4 | Result in inadequate emergency access. |

Intersection Thresholds

City of Santa Ana

The City of Santa Ana General Plan Circulation Element indicates that acceptable LOS is LOS D or better, except within the City's defined major development areas where LOS E is considered acceptable. If a signalized intersection is operating at unsatisfactory LOS in the baseline condition, an addition of 0.01 to the ICU value would constitute a significant project impact. For unsignalized intersections, an intersection that operates at an unacceptable LOS E or worse and meets the peak hour signal warrant would constitute a significant project impact.

City of Irvine

The City of Irvine considers acceptable LOS to be LOS D or better, except within the Irvine Business Complex (IBC) where LOS E is acceptable. If an intersection is operating at unsatisfactory LOS in the baseline condition, an addition of 0.02 (rounded to the 2nd decimal place) to the ICU value would constitute a significant project impact. Every study intersection in the City of Irvine is located in the IBC, where the LOS E standard would apply.

City of Tustin

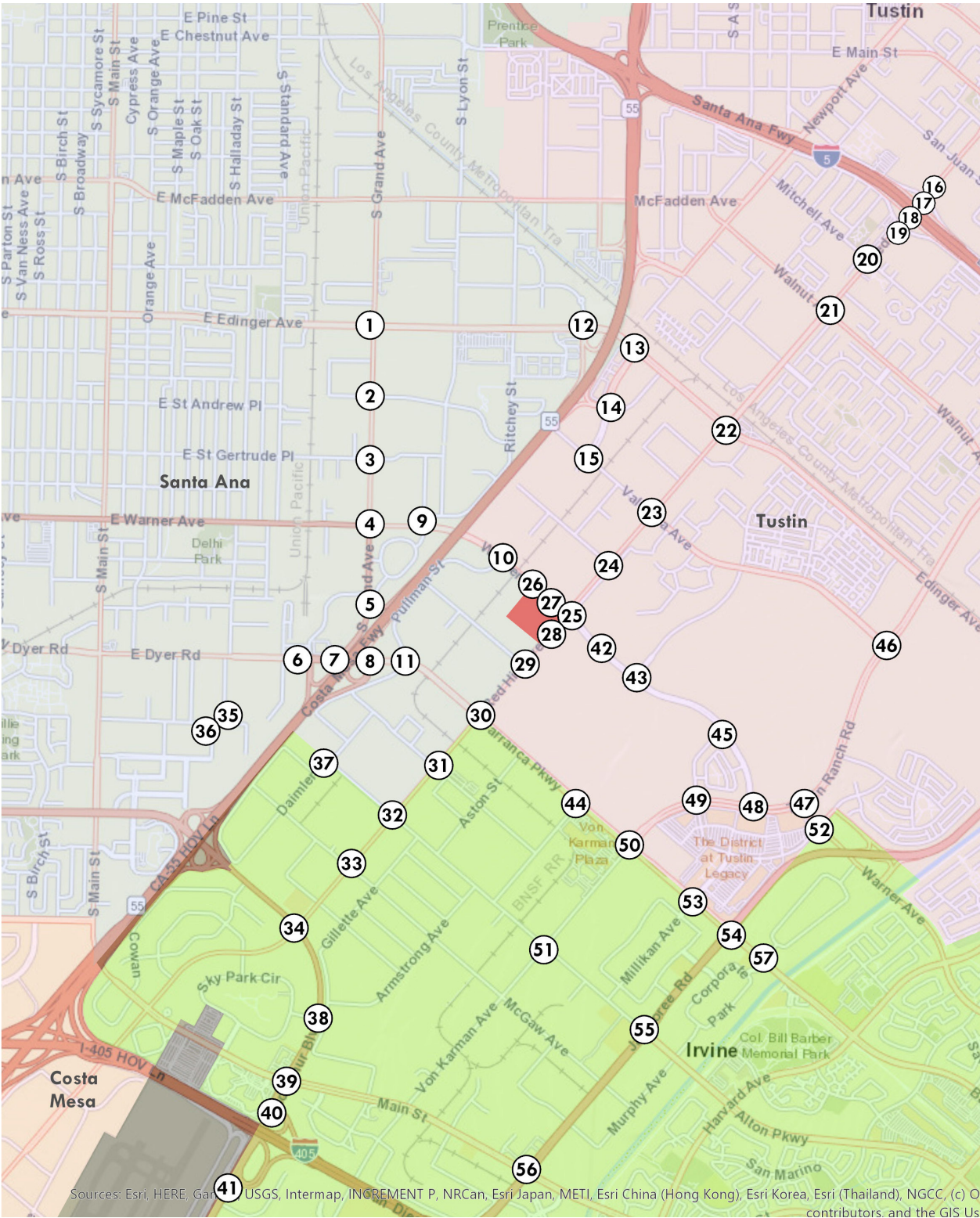
The City of Tustin considers acceptable LOS to be LOS D or better. If an intersection is operating at unsatisfactory LOS in the baseline condition, an addition of 0.01 to the ICU value would constitute a significant project impact.

Congestion Management Program (CMP) Intersections

At CMP intersections, LOS E is considered acceptable. If an intersection is operating at LOS E in the baseline condition, an addition of 0.01 to the ICU value would constitute a significant project impact. The following two intersections are CMP intersections, where the LOS E standard would apply:

- #12: SR-55 SB Ramps/Edinger Avenue (City of Santa Ana/Caltrans)
- #13: Newport Avenue/Edinger Avenue (City of Tustin)

Study Area Intersections



 Project Site



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5.14.5 METHODOLOGY

Project Trip Distribution Methodology

Trip distribution patterns for the proposed Project were developed based on select zone model runs from the Orange County Transportation Analysis Model (OCTAM) and consideration of the Project location in relation to the surrounding land uses and regional transportation network. The Project trip generation was applied to the trip distribution patterns to develop the Project trip assignment. Project trip distribution details are provided in the Traffic Impact Analysis Report, which is included as Appendix K.

Intersection Operations Methodology

Intersection operations are evaluated using LOS, which is a measure of the delay experienced by drivers on a roadway facility. LOS A indicates free-flow traffic conditions and is generally the best operating conditions. LOS F is an extremely congested condition and is the worst operating condition from the driver's perspective. In this analysis, LOS at all signalized intersections is calculated using the Intersection Capacity Utilization (ICU) methodology. Intersections under the jurisdiction of Caltrans is also evaluated using the Highway Capacity Manual (HCM), 6th Edition methodology. LOS at unsignalized intersections is calculated using the HCM, 6th Edition methodology. The ICU methodology is a planning-level operational methodology and provides an estimate of the volume to capacity (v/c) ratio at a signalized intersection. The LOS at the intersection is determined according to the values shown in Table 5.14-2.

Table 5.14-2: Relationship between ICU and LOS

LOS	ICU (V/C Ratio)
A	≤ 0.60
B	0.61 to ≤ 0.70
C	0.71 to ≤ 0.80
D	0.81 to ≤ 0.90
E	0.91 to ≤ 1.00
F	>1.00

Using the HCM methodology, LOS at signalized intersections is defined in terms of the weighted average control delay for the intersection as a whole. Control delay is a measure of the increase in travel time that is experienced due to traffic signal control and is expressed in terms of average control delay per vehicle (in seconds). Control delay is determined based on the intersection geometry and volume, signal cycle length, phasing and coordination along the arterial corridor. Table 5.14-3 shows the relationship between control delay and LOS at a signalized intersection.

Table 5.14-3: Relationship between Control Delay and LOS at a Signalized Intersection

LOS	Delay (Seconds per Vehicle)
A	≤ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	>80

There are only two unsignalized intersections in the Project study area and both are two-way stop control (TWSC) intersections. The Highway Capacity Manual TWSC intersection methodology calculates LOS based on the delay experienced by drivers on the minor (stop-controlled) approaches to the intersection. For TWSC intersections, LOS is determined for each minor-street movement, as well as the major-street left-turns. The relationship between delay and LOS at TWSC intersections is shown in Table 5.14-4.

Table 5.14-4: Relationship between Delay and LOS at a TWSC Intersection

LOS	Delay (seconds)
A	0-10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

Volume Forecast Methodology

Forecast traffic volumes for the Opening Year conditions were developed by applying a growth rate of 1.02 percent per year to the 2019 traffic counts and adding traffic from nearby cumulative development projects (approved and not yet build and those under review). The growth rate was calculated by comparing existing and forecast year 2040 traffic volumes in the study area. Cumulative projects were provided by the Cities of Santa Ana, Irvine and Tustin.

The 2040 Buildout traffic volumes were forecast using the Orange County Transportation Analysis Model (OCTAM). At the request of the City of Irvine, the OCTAM land use database was reviewed and modified as needed to include all cumulative development projects identified by the Cities of Irvine and Tustin. OCTAM model data was post-processed using the NCHRP 765 methodology. See the Traffic Impact Analysis (Appendix K) for additional detail.

5.14.6 ENVIRONMENTAL IMPACTS

IMPACT TR-1: THE PROJECT WOULD CONFLICT WITH A PROGRAM, PLAN, ORDINANCE, OR POLICY ADDRESSING THE CIRCULATION SYSTEM, INCLUDING TRANSIT, ROADWAY, BICYCLE, AND PEDESTRIAN FACILITIES.

Significant and Unavoidable Impact. The proposed Project would generate traffic from development of the proposed 1,150 multi-family residential units and the 80,000 square feet of commercial space. As described in Section 3.0, *Project Description*, the proposed commercial space would consist of the following uses:

- Shopping Center: 18,000 square feet
- Fast Casual Restaurant: 5,000 square feet
- Quality Restaurant: 25,000 square feet
- High-Turnover Sit-Down Restaurant: 25,000 square feet
- Fast Food Restaurant (no drive-through): 5,000 square feet
- Coffee/Donut Shop (no drive-through): 2,000 square feet

Access to the proposed Project would be provided via a full-access driveway and a right-in/right-out driveway on Warner Avenue and a right-in/right-out driveway on Red Hill Avenue. The proposed full-access driveway on Warner Avenue would be slightly offset to the east from the adjacent driveway on the north side of Warner Avenue. This driveway would be signalized with split-phase operation in the northbound and southbound direction.

Project Trip Generation

Vehicle trips for the Project were generated by using the trip rates from the Institute of Transportation Engineers (ITE) Trip Generation (10th Edition, 2017), and takes credit for the existing development on the site. As shown in Table 5.14-5, the Project is anticipated to generate 11,546 new daily trips, including 534 a.m. peak hour and 604 p.m. peak hour trips.

Table 5.14-5 Proposed Project Trip Generation

		A.M. Peak Hour			P.M. Peak Hour				
Land Use	Units	In	Out	Total	In	Out	Total	Daily	
Future Uses									
Apartments	1,150 DU	0.09	0.27	0.36	0.27	0.17	0.44	5.44	
Trip Generation Rates ¹		108	306	414	309	197	506	6,256	
Trip Generation		(6)	(63)	(69)	(58)	(37)	(95)	(164)	
Internal Trips ²		102	243	345	251	160	411	6,092	
Total Net Trip Generation									
High-Turnover Sit Down Restaurant	25.000 TSF	5.47	4.47	9.94	6.06	3.71	9.77	112.18	
Trip Generation Rates ³		137	112	249	151	94	245	2,805	
Trip Generation		(27)	(3)	(29)	(15)	(20)	(36)	(65)	
Internal Trips ²		110	109	220	136	74	209	2,740	
External Trips		0	0	0	(58)	(32)	(90)	(589)	
Pass-By Trips		110	109	220	77	42	119	2,151	
Total Net Trip Generation									
Retail	18.000 TSF	0.58	0.36	0.94	1.83	1.98	3.81	37.75	
Trip Generation Rates ⁴		10	7	17	33	36	69	680	
Trip Generation		(3)	(2)	(5)	(20)	(19)	(39)	(44)	
Internal Trips ²		7	5	12	13	17	30	636	
External Trips		(2)	(1)	(3)	(4)	(6)	(10)	(153)	
Pass-By Trips		5	4	9	9	11	20	483	
Total Net Trip Generation									
Quality Restaurant	25.000 TSF	0.37	0.37	0.73	5.23	2.57	7.80	83.84	
Trip Generation Rates ⁵		9	9	18	131	64	195	2,096	
Trip Generation		(2)	(0)	(2)	(13)	(14)	(27)	(29)	
Internal Trips ²		7	9	16	118	50	168	2,067	
External Trips		0	0	0	(52)	(22)	(74)	(455)	
Pass-By Trips		7	9	16	66	28	94	1,612	
Total Net Trip Generation									
Fast Casual Restaurant	5.000 TSF	1.39	0.68	2.07	7.77	6.36	14.13	315.17	
Trip Generation Rates ⁶		7	3	10	39	32	71	1,576	
Trip Generation		(1)	(0)	(1)	(4)	(7)	(11)	(12)	
Internal Trips ²		6	3	9	35	25	60	1,564	
External Trips		0	0	0	(15)	(11)	(26)	(336)	
Pass-By Trips		6	3	9	20	14	34	1,228	
Total Net Trip Generation									
Fast-Food Restaurant without Drive-Through Window		5.000 TSF	15.06	10.04	25.10	14.17	14.17	28.34	346.23
Trip Generation Rates ⁷	75		51	126	71	71	142	1,731	
Trip Generation	(15)		(1)	(16)	(7)	(15)	(23)	(38)	
Internal Trips ²	60		50	110	64	56	119	1,693	
External Trips	(24)		(19)	(43)	(26)	(22)	(48)	(660)	
Pass-By Trips	37		30	67	38	33	72	1,033	
Total Net Trip Generation									
Coffee/Donut Shop without Drive-Through Window		2.000 TSF	45.38	43.61	88.99	21.69	21.69	43.38	820.38
Trip Generation Rates ⁸	91		87	178	43	44	87	1,641	
Trip Generation	(18)		(2)	(20)	(4)	(10)	(14)	(34)	
Internal Trips ²	73		85	158	39	34	73	1,607	
External Trips	(61)		(71)	(131)	(32)	(29)	(61)	(1,334)	
Pass-By Trips	12		14	27	7	6	12	273	
Total Net Trip Generation									
Existing Uses									
Industrial Park⁹	212.121 TSF	36	9	45	9	36	45	379	
Passenger Vehicles		89	25	114	22	92	114	947	
Trucks		125	34	159	31	128	159	1,326	
Total Net Trip Generation									
Total Net Trip Generation		155	379	534	437	167	604	11,546	

Source: Appendix K.

Trip generation based on rates from Institute of Transportation Engineers' (ITE) Trip Generation (10th Edition) for:

¹ Land Use 221 - "Multifamily Housing (Mid-Rise)".² Internal trip capture is from ITE Trip Generation Handbook (3rd Edition).³ Land Use 820 - "Shopping Center"⁴ Land Use 931 - "Quality Restaurant"⁵ Land Use 930 - "Fast Casual Restaurant"

⁶ Land Use 933 - "Fast-Food Restaurant without Drive-Through Window"⁷ Land Use 937 - "Coffee/Donut Shop without Drive Through Window"⁸ Land Use 130 - "Industrial Park"

Existing Plus Project

The Existing plus Project traffic volumes were determined by adding the net new Project trips to Existing Without Project traffic volumes. Table 5.1 4-6 provides a comparison between the Existing Without and With Project conditions. As shown, all study area intersections would continue to operate at satisfactory LOS in the Existing plus Project condition. However, the Project driveway on Red Hill Avenue is forecast to operate at LOS F for vehicles leaving the site in the a.m. peak hour. The forecast delay of 53.4 seconds with a queue of six vehicles would be experienced by drivers making an eastbound right-turn out of the Project site. Vehicles traveling along on Red Hill Avenue would not experience a delay. Project traffic using the driveway on Red Hill Avenue could utilize one of the two driveways on Warner Avenue during the a.m. peak hour, should they choose not to wait at the Red Hill Avenue driveway. The signalized driveway on Warner Avenue is forecast to operate at LOS A and the unsignalized driveway on Warner Avenue is forecast to operate at LOS C. Therefore, both of the Warner Avenue driveways have residual capacity to accommodate the additional traffic from the Red Hill Avenue driveway. Because this is an effect at an onsite driveway location, which could be avoided by use of other driveways, impacts would be less than significant.

Table 5.14-6: Existing Plus Project Peak Hour Intersection Levels of Service

Intersection		Signal Control	Existing				Existing plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
1.	Grand Ave./Edinger Ave.	Signal	0.710	C	0.843	D	0.718	C	0.844	D	0.008	0.001	No	No
2.	Grand Ave./St. Andrew Pl.	Signal	0.349	A	0.506	A	0.354	A	0.508	A	0.005	0.002	No	No
3.	Grand Ave./St. Gertrude Pl.	Signal	0.407	A	0.484	A	0.410	A	0.491	A	0.003	0.007	No	No
4.	Grand Ave./Warner Ave.	Signal	0.549	A	0.716	C	0.560	A	0.740	C	0.011	0.024	No	No
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	0.486	A	0.509	A	0.486	A	0.509	A	0.000	0.000	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	0.663	B	0.739	C	0.670	B	0.742	C	0.007	0.003	No	No
7.	Grand Ave./Dyer Rd.	Signal	0.585	A	0.622	B	0.587	A	0.624	B	0.002	0.002	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	0.562	A	0.389	A	0.563	A	0.391	A	0.001	0.002	No	No
9.	Wright St./Warner Ave.	Signal	0.398	A	0.646	B	0.413	A	0.654	B	0.015	0.008	No	No
10.	Pullman St./Warner Ave.	Signal	0.335	A	0.434	A	0.346	A	0.438	A	0.011	0.004	No	No
11.	Pullman St./Dyer Rd.	Signal	0.467	A	0.702	C	0.473	A	0.702	C	0.006	0.000	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	0.600	A	0.591	A	0.601	B	0.592	A	0.001	0.001	No	No
13.	Newport Ave./Edinger Ave.	Signal	0.645	B	0.357	A	0.646	B	0.378	A	0.001	0.021	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	0.461	A	0.613	B	0.465	A	0.613	B	0.004	0.000	No	No
15.	Newport Ave./Valencia Ave.	Signal	0.147	A	0.306	A	0.149	A	0.310	A	0.002	0.004	No	No
16.	Red Hill Ave./El Camino Real	Signal	0.610	B	0.534	A	0.611	B	0.535	A	0.001	0.001	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	0.618	B	0.582	A	0.618	B	0.583	A	0.000	0.001	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	0.724	C	0.666	B	0.724	C	0.666	B	0.000	0.000	No	No
19.	Red Hill Ave./Nisson Rd.	Signal	0.561	A	0.606	B	0.561	A	0.606	B	0.000	0.000	No	No
20.	Red Hill Ave./Mitchell Ave.	Signal	0.529	A	0.509	A	0.529	A	0.510	A	0.000	0.001	No	No
21.	Red Hill Ave./Walnut Ave.	Signal	0.590	A	0.684	B	0.590	A	0.684	B	0.000	0.000	No	No
22.	Red Hill Ave./Edinger Ave.	Signal	0.500	A	0.760	C	0.500	A	0.760	C	0.000	0.000	No	No
23.	Red Hill Ave./Valencia Ave.	Signal	0.471	A	0.441	A	0.485	A	0.447	A	0.014	0.006	No	No
24.	Red Hill Ave./Victory Rd.	Signal	0.357	A	0.409	A	0.357	A	0.409	A	0.000	0.000	No	No
25.	Red Hill Ave./Warner Ave.	Signal	0.500	A	0.567	A	0.571	A	0.690	B	0.071	0.123	No	No
26.	Driveway 1/Warner Ave.	Signal	-	-	-	-	0.436	A	0.577	A	-	-	No	No
27.	Driveway 2/Warner Ave.	TWSC	-	-	-	-	15.5	C	19.1	C	-	-	No	No
28.	Red Hill Ave./Driveway 3	TWSC	-	-	-	-	53.4	F	16.2	C	-	-	No	No
29.	Red Hill Ave./Carnegie Ave.	Signal	0.334	A	0.382	A	0.369	A	0.406	A	0.035	0.024	No	No
30.	Red Hill Ave./Barranca Pkwy.	Signal	0.564	A	0.785	C	0.583	A	0.859	D	0.019	0.074	No	No
31.	Red Hill Ave./Deere Ave.	Signal	0.410	A	0.699	B	0.427	A	0.732	C	0.017	0.033	No	No
32.	Red Hill Ave./Alton Pkwy.	Signal	0.489	A	0.833	D	0.503	A	0.859	D	0.014	0.026	No	No
33.	Red Hill Ave./McGaw Ave.	Signal	0.462	A	0.719	C	0.475	A	0.733	C	0.013	0.014	No	No
34.	Red Hill Ave./MacArthur Blvd.	Signal	0.604	B	0.762	C	0.614	B	0.770	C	0.010	0.008	No	No
35.	Halladay St. E/Alton Ave.	TWSC	10.5	B	9.9	A	10.5	B	9.9	A	0.000	0.000	No	No
36.	Halladay St. W/Alton Ave.	TWSC	12.2	B	11.6	B	12.2	B	11.6	B	0.000	0.000	No	No
37.	Daimler St./Alton Pkwy.	AWSC	9.9	A	10.6	B	10.0	A	10.6	B	0.100	0.000	No	No
38.	MacArthur Blvd./Sky Park East	Signal	0.328	A	0.503	A	0.331	A	0.508	A	0.003	0.005	No	No

Intersection		Signal Control	Existing				Existing plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
39.	MacArthur Blvd./Main St.	Signal	0.533	A	0.696	B	0.536	A	0.697	B	0.003	0.001	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	0.759	C	0.696	B	0.762	C	0.702	C	0.003	0.006	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	0.533	A	0.643	B	0.534	A	0.645	B	0.001	0.002	No	No
42.	Reserve Center Driveway/Warner Ave.	Signal	0.122	A	0.183	A	0.135	A	0.195	A	0.013	0.012	No	No
43.	Armstrong Ave./Warner Ave.	Signal	0.153	A	0.196	A	0.172	A	0.221	A	0.019	0.025	No	No
44.	Armstrong Ave./Barranca Pkwy.	Signal	0.433	A	0.681	B	0.450	A	0.687	B	0.017	0.006	No	No
45.	Legacy Rd./Warner Ave.	Signal	0.103	A	0.188	A	0.112	A	0.199	A	0.009	0.011	No	No
46.	Tustin Ranch Rd./Valencia Ave.	Signal	0.465	A	0.493	A	0.468	A	0.496	A	0.003	0.003	No	No
47.	Tustin Ranch Rd./Warner Ave. N	Signal	0.365	A	0.659	B	0.371	A	0.669	B	0.006	0.010	No	No
48.	Tustin Ranch Rd./Warner Ave. S	Signal	0.386	A	0.543	A	0.400	A	0.552	A	0.014	0.009	No	No
49.	Tustin Ranch Rd./Park Ave.	Signal	0.515	A	0.663	B	0.515	A	0.665	B	0.000	0.002	No	No
50.	Tustin Ranch Rd./Barranca Pkwy.	Signal	0.711	C	0.819	D	0.713	C	0.825	D	0.002	0.006	No	No
51.	Von Karman Ave./Alton Pkwy.	Signal	0.676	B	0.819	D	0.679	B	0.820	D	0.003	0.001	No	No
52.	Park Ave./Warner Ave.	Signal	0.449	A	0.693	B	0.458	A	0.697	B	0.009	0.004	No	No
53.	Millikan Ave./Barranca Pkwy.	Signal	0.436	A	0.632	B	0.440	A	0.632	B	0.004	0.000	No	No
54.	Jamboree Rd./Barranca Pkwy.	Signal	0.760	C	0.904	E	0.765	C	0.911	E	0.005	0.007	No	No
55.	Jamboree Rd./Alton Pkwy.	Signal	0.721	C	0.806	D	0.723	C	0.808	D	0.002	0.002	No	No
56.	Jamboree Rd./Main St.	Signal	0.754	C	0.800	C	0.754	C	0.800	D	0.000	0.000	No	No
57.	Corporate Park/Barranca Pkwy.	Signal	0.333	A	0.549	A	0.340	A	0.559	A	0.007	0.010	No	No

Caltrans Analysis

Intersection		Signal Control	Existing				Existing plus Project				Delay Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS				
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	11.8	B	14.1	B	11.8	B	14.3	B	0.00	0.20	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	41.5	D	42.5	D	41.6	D	42.8	D	0.10	0.30	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	21.8	C	15.2	B	21.8	C	15.3	B	0.00	0.10	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	37.5	D	41.9	D	37.5	D	42.2	D	0.00	0.30	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	30.4	C	38.0	D	32.1	C	41.4	D	1.70	3.40	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	25.5	C	21.5	C	26.2	C	21.6	C	0.70	0.10	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	41.8	D	34.1	C	44.2	D	34.1	C	2.40	0.00	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	35.3	C	20.5	C	34.0	D	21.0	A	-1.30	0.50	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	25.1	C	25.5	C	25.3	C	25.5	C	0.20	0.00	No	No

Source: Appendix K.

Notes: **Bold** = Exceeds LOS Standard; AWSC = All Way Stop Control; TWSC = Two Way Stop Control

Opening Year (2022) Plus Project

The Opening Year (2022) traffic volumes were developed by applying a growth rate of 1.02 percent per year to the existing (2019) traffic volumes and adding traffic generated by cumulative projects. The growth rate was calculated assuming a straight-line growth rate between Existing and Year 2040 conditions in the study area, as modeled using the OCTAM traffic model. Approved and pending development projects were obtained from the Cities of Santa Ana, Irvine and Tustin. As shown in Table 5.14-7, the cumulative projects are anticipated to generate 5,095 a.m. peak hour trips, 6,110 p.m. peak hour trips, and 69,375 daily trips.

Table 5.14-7: Summary of Cumulative Project Trips

		Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Trip Rates									
Multifamily Housing (Mid-Rise) ¹		DU	5.440	0.094	0.266	0.360	0.268	0.172	0.440
Shopping Center ²		TSF	37.750	0.583	0.357	0.940	1.829	1.981	3.810
Senior Adult Housing - Attached ³		DU	3.700	0.070	0.130	0.200	0.143	0.117	0.260
Multifamily Housing (Low-Rise) ⁴		DU	7.320	0.106	0.354	0.460	0.353	0.207	0.560
Fast Food Restaurant with Drive-Through Window ⁵		TSF	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Hotel ⁶		Rooms	8.360	0.277	0.193	0.470	0.306	0.294	0.600
Quality Restaurant ⁷		TSF	83.840	-	-	-	5.226	2.574	7.800
Industrial Park ⁸		TSF	3.370	0.324	0.076	0.400	0.084	0.316	0.400
General Office Building ⁹		TSF	9.740	0.998	0.162	1.160	0.184	0.966	1.150
Warehouse ¹⁰		TSF	1.740	0.131	0.039	0.170	0.051	0.139	0.190
High Turnover (Sit-Down) Restaurant ¹¹		TSF	112.180	5.467	4.473	9.940	6.057	3.713	9.770
Gas/Service Station ¹²		TSF	1265.670	34.295	34.295	68.590	42.275	42.275	84.550
Hospital ¹³		TSF	10.720	0.605	0.285	0.890	0.310	0.660	0.970
Single Family Detached Housing ¹⁴		DU	9.440	0.185	0.555	0.740	0.624	0.366	0.990
<u>Cumulative Project Trip Generation</u>									
<u>Santa Ana</u>									
S1: Madison Project Residential ¹	260	DU	1414	24	69	94	70	45	114
S1: Madison Project Retail ²	6.50	TSF	245	4	2	6	12	13	25
S2: AMG East First Senior Apartments ³	418	DU	1547	29	54	84	60	49	109
S3: AMG East First Apartments/First Pointe ¹	552	DU	3003	58	196	254	195	114	309
S4: Wermers Properties Mixed-Use Development Residential ¹	603	DU	3280	56	161	217	162	103	265
S4: Wermers Properties Mixed-Use Development Retail ²	8.90	TSF	336	5	3	8	16	18	34
S5: AMCAL First Street Family Apartments ⁴	69	DU	505	7	24	32	24	14	39
S6: Heritage Village Residential ¹	1221	DU	6642	114	325	440	328	210	537
S7: Legado at the MET ¹	278	DU	1512	26	74	100	75	48	122
S8: Legacy Multi-Family Residential at Sunflower ¹	233	DU	1268	22	62	84	63	40	103
S9: Jack In the Box w/ drive-through ⁵	2.66	TSF	1255	55	52	107	45	42	87
S10: Tapestry by Hilton Hotel ⁶	110	Rooms	920	31	21	52	34	32	66
S10: Tapestry by Hilton Restaurant ¹¹	5	TSF	561	27	22	50	30	19	49
S11: Shea ITT ⁸	500	TSF	1685	162	38	200	42	158	200
<u>Irvine</u>									
I1: 272,000 Office Building on Barranca Pkwy. ⁹	272.00	TSF	2649	271	44	316	50	263	313
I1: Existing Office Buildings ⁹	48	TSF	468	48	8	56	9	46	55
I2: Alton Residential Project ¹	357	DU	1942	33	95	129	96	61	157
I2: Existing Warehouse ¹⁰	200	TSF	348	26	8	34	10	28	38
I3: Gillette Ave Apartments ¹	336	DU	1828	31	90	121	90	58	148
I4: Main Street Apartments ¹	150	DU	816	14	40	54	40	26	66
I5: Rockefeller Mixed Use Residential ¹	285	DU	1550	27	76	103	76	49	125
I5: Rockefeller Mixed Use Retail ²	11.13	TSF	420	6	4	10	20	22	42
I6: Trilogy Residential ^{1,17}	876	DU	4765	82	233	315	235	150	385
I6: Existing Office Buildings ⁹	315	TSF	3068	314	51	365	58	304	362
I7: Von Karman Café ¹¹	5.04	TSF	565	28	23	50	31	19	49
I8: Elements Residential ¹	1600	DU	8704	150	426	576	429	275	704
I8: Elements Retail ²	17	TSF	642	10	6	16	31	34	65

	Units		Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
<i>Tustin</i>									
T1: The Village at Tustin Legacy Hospital ¹³	69.57	TSF	746	42	20	62	22	46	67
T2: Levity at Tustin Legacy ¹	161	DU	876	15	43	58	43	28	71
T2: Levity at Tustin Legacy ¹⁴	57	DU	538	11	32	42	36	21	56
T3: Brookfield Residential ¹⁴	117	DU	1104	22	65	87	73	43	116
T3: Brookfield Residential ⁴	129	DU	702	12	34	46	35	22	57
T3: Brookfield Residential ¹	154	DU	1127	16	55	71	54	32	86
T4: Flight at Tustin Legacy ⁹	870	TSF	8474	868	141	1009	160	840	1001
T5: Vintage ⁴	140	DU	1025	15	50	64	49	29	78
<i>Newport Beach</i>									
N1: Newport Crossings Residential ¹⁵	350	DU	1904	31	95	126	95	59	154
N1: Newport Crossings Retail ¹⁵	5.5	TSF	198	4	3	7	9	9	18
N1: Newport Crossings Restaurant ¹⁵	2.0	TSF	224	11	9	20	12	8	20
N2: Uptown Newport Full Project (1,244 DU and 11.5 TSF of Retail and Restaurant) ¹⁵			8286	44	499	542	522	204	727
Total Trip Generation			69,375	1,976	3,120	5,095	3,287	2,822	6,110

Source: Appendix K.

Trip Generation shown in *Italics* is existing and is credited to the trip generation total.

Trip generation based on rates from Institute of Transportation Engineers' (ITE) Trip Generation (10th Edition) for:

¹ Land Use 221 - Multifamily Housing (Mid-Rise)

² Land Use 820 - Shopping Center

³ Land Use 252 - Senior Adult Housing - Attached

⁴ Land Use 220 - Multifamily Housing (Low-Rise)

⁵ Land Use 934 - Fast-Food Restaurant with Drive-Through Window

⁶ Land Use 310 - Hotel

⁷ Land Use 931 - "Quality Restaurant"

⁸ Land Use 130 - "Industrial Park"

⁹ Land Use 710 - General Office Building

¹⁰ Land Use 150 - Warehousing

¹¹ Land Use 932 - High Turnover (Sit-Down) Restaurant

¹² Land Use 944 - Gasoline/Service Station with Convenience Market

¹³ Land Use 610 - Hospital

¹⁴ Land Use 210 - Single Family Detached Housing

¹⁶ Project Trips were taken from each projects respective Traffic Impact Analysis Project Trip Generation

¹⁷ Per information provided by the City of Irvine, the retail space included in the project is considered ancillary and is included in the residential trip generation

In the Opening Year (2022) with the cumulative project trips listed in Table 5.14-7 and operation of the proposed Project, the Project driveway on Red Hill Avenue is forecast to operate at LOS F for vehicles exiting the site, which is consistent with the Existing Plus Project condition. In 2022, a forecasted delay of 60.4 seconds (6.4 vehicles) is anticipated to be experienced by drivers making an eastbound right-turn out of the Project site. Through vehicles on Red Hill Avenue would not experience any delay.

Consistent with the Existing Plus Project condition, drivers leaving the site in the a.m. peak hour could choose to utilize one of the two driveways on Warner and not wait at the Red Hill Avenue driveway. The signalized driveway on Warner Avenue is forecast to operate at LOS A and the unsignalized driveway on Warner Avenue is forecast to operate at LOS C in the Opening Year (2022) plus Project condition. Both of the Warner Avenue driveways have adequate capacity to accommodate the additional traffic from the Red Hill Avenue driveway. Because this is an effect at an onsite driveway location, which could be avoided by use of other driveways, impacts would be less than significant, and no mitigation measures are required for the onsite driveway at Red Hill Avenue.

Table 5.14-8 provides a comparison between the Opening Year (2022) Without and With Project conditions. As shown, with the proposed Project, intersections of Red Hill Avenue/Barranca Parkway (#30) would not operate at satisfactory levels of service in the p.m. peak hour and would be impacted with operation of the Project. As a result, improvements for the intersection have been identified, which involve addition of a westbound protected right-turn overlap phase and prohibit southbound U-turns that have been included as Mitigation Measure TR-1. As shown on Table 5.14-9, impacts at the intersection would be reduced to a less than significant impact with implementation of the improvment. However, improvements at

Table 5.14-8: Opening Year 2022 Plus Project Peak Hour Intersection Levels of Service

Intersection		Signal Control	Opening Year				Opening Year plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
1.	Grand Ave./Edinger Ave.	Signal	0.733	C	0.869	D	0.762	C	0.896	D	0.029	0.027	No	No
2.	Grand Ave./St. Andrew Pl.	Signal	0.359	A	0.522	A	0.374	A	0.539	A	0.015	0.017	No	No
3.	Grand Ave./St. Gertrude Pl.	Signal	0.420	A	0.499	A	0.435	A	0.520	A	0.015	0.021	No	No
4.	Grand Ave./Warner Ave.	Signal	0.573	A	0.752	C	0.600	B	0.798	C	0.027	0.046	No	No
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	0.520	A	0.549	A	0.535	A	0.565	A	0.015	0.016	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	0.752	C	0.809	D	0.781	C	0.836	D	0.029	0.027	No	No
7.	Grand Ave./Dyer Rd.	Signal	0.634	B	0.690	C	0.653	B	0.711	C	0.019	0.021	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	0.619	B	0.440	A	0.638	B	0.459	A	0.019	0.019	No	No
9.	Wright St./Warner Ave.	Signal	0.413	A	0.678	B	0.440	A	0.705	C	0.027	0.027	No	No
10.	Pullman St./Warner Ave.	Signal	0.352	A	0.461	A	0.373	A	0.470	A	0.021	0.009	No	No
11.	Pullman St./Dyer Rd.	Signal	0.525	A	0.769	C	0.545	A	0.792	C	0.020	0.023	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	0.644	B	0.607	B	0.663	B	0.626	B	0.019	0.019	No	No
13.	Newport Ave./Edinger Ave.	Signal	0.670	B	0.382	A	0.691	B	0.406	A	0.021	0.024	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	0.489	A	0.662	B	0.508	A	0.683	B	0.019	0.021	No	No
15.	Newport Ave./Valencia Ave.	Signal	0.154	A	0.344	A	0.160	A	0.359	A	0.006	0.015	No	No
16.	Red Hill Ave./El Camino Real	Signal	0.641	B	0.555	A	0.656	B	0.574	A	0.015	0.019	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	0.643	B	0.616	B	0.663	B	0.636	B	0.020	0.020	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	0.760	C	0.690	B	0.784	C	0.711	C	0.024	0.021	No	No
19.	Red Hill Ave./Nissan Rd.	Signal	0.584	A	0.638	B	0.602	B	0.657	B	0.018	0.019	No	No
20.	Red Hill Ave./Mitchell Ave.	Signal	0.561	A	0.542	A	0.578	A	0.560	A	0.017	0.018	No	No
21.	Red Hill Ave./Walnut Ave.	Signal	0.623	B	0.722	C	0.643	B	0.744	C	0.020	0.022	No	No
22.	Red Hill Ave./Edinger Ave.	Signal	0.515	A	0.807	D	0.532	A	0.831	D	0.017	0.024	No	No
23.	Red Hill Ave./Valencia Ave.	Signal	0.513	A	0.546	A	0.543	A	0.563	A	0.030	0.017	No	No
24.	Red Hill Ave./Victory Rd.	Signal	0.371	A	0.424	A	0.382	A	0.438	A	0.011	0.014	No	No
25.	Red Hill Ave./Warner Ave.	Signal	0.520	A	0.595	A	0.609	A	0.722	C	0.089	0.127	No	No
26.	Driveway 1/Warner Ave.	Signal	-	-	-	-	0.463	A	0.625	C	-	-	No	No
27.	Driveway 2/Warner Ave.	TWSC	-	-	-	-	16.3	C	19.8	C	-	-	No	No
28.	Red Hill Ave./Driveway 3	TWSC	-	-	-	-	60.4	F	16.7	C	-	-	No	No
29.	Red Hill Ave./Carnegie Ave.	Signal	0.346	A	0.395	A	0.394	A	0.432	A	0.048	0.037	No	No
30.	Red Hill Ave./Barranca Pkwy.	Signal	0.641	B	0.908	E	0.687	B	1.007	F	0.046	0.099	No	Yes
31.	Red Hill Ave./Deere Ave.	Signal	0.447	A	0.768	C	0.483	A	0.824	D	0.036	0.056	No	No
32.	Red Hill Ave./Alton Pkwy.	Signal	0.526	A	0.884	D	0.556	A	0.936	E	0.030	0.052	No	No
33.	Red Hill Ave./McGaw Ave.	Signal	0.506	A	0.784	C	0.536	A	0.826	D	0.030	0.042	No	No
34.	Red Hill Ave./MacArthur Blvd.	Signal	0.671	B	0.825	D	0.703	C	0.863	D	0.032	0.038	No	No
35.	Halladay St. E/Alton Ave.	TWSC	10.5	B	10.0	B	10.5	B	10.0	B	0.000	0.000	No	No
36.	Halladay St. W/Alton Ave.	TWSC	10.9	B	11.8	B	10.9	B	11.8	B	0.000	0.000	No	No
37.	Daimler St./Alton Pkwy.	AWSC	10.1	B	10.8	B	10.1	B	10.9	B	0.000	0.100	No	No
38.	MacArthur Blvd./Sky Park East	Signal	0.356	A	0.544	A	0.370	A	0.568	A	0.014	0.024	No	No

Intersection		Signal Control	Opening Year				Opening Year plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
39.	MacArthur Blvd./Main St.	Signal	0.567	A	0.737	C	0.588	A	0.761	C	0.021	0.024	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	0.813	D	0.765	C	0.834	D	0.772	C	0.021	0.007	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	0.572	A	0.710	C	0.601	B	0.753	C	0.029	0.043	No	No
42.	Reserve Center Driveway/Warner Ave.	Signal	0.129	A	0.191	A	0.146	A	0.209	A	0.017	0.018	No	No
43.	Armstrong Ave./Warner Ave.	Signal	0.165	A	0.252	A	0.195	A	0.285	A	0.030	0.033	No	No
44.	Armstrong Ave./Barranca Pkwy.	Signal	0.519	A	0.766	C	0.547	A	0.803	D	0.028	0.037	No	No
45.	Legacy Rd./Warner Ave.	Signal	0.131	A	0.255	A	0.144	A	0.273	A	0.013	0.018	No	No
46.	Tustin Ranch Rd./Valencia Ave.	Signal	0.510	A	0.529	A	0.529	A	0.549	A	0.019	0.020	No	No
47.	Tustin Ranch Rd./Warner Ave. N	Signal	0.401	A	0.703	C	0.420	A	0.735	C	0.019	0.032	No	No
48.	Tustin Ranch Rd./Warner Ave. S	Signal	0.421	A	0.592	A	0.448	A	0.620	B	0.027	0.028	No	No
49.	Tustin Ranch Rd./Park Ave.	Signal	0.568	A	0.754	C	0.586	A	0.778	C	0.018	0.024	No	No
50.	Tustin Ranch Rd./Barranca Pkwy.	Signal	0.781	C	0.910	E	0.811	D	0.943	E	0.030	0.033	No	No
51.	Von Karman Ave./Alton Pkwy.	Signal	0.712	C	0.883	D	0.734	C	0.939	E	0.022	0.056	No	No
52.	Park Ave./Warner Ave.	Signal	0.477	A	0.736	C	0.501	A	0.762	C	0.024	0.026	No	No
53.	Millikan Ave./Barranca Pkwy.	Signal	0.473	A	0.667	B	0.491	A	0.686	B	0.018	0.019	No	No
54.	Jamboree Rd./Barranca Pkwy.	Signal	0.822	D	0.962	E	0.851	D	0.997	E	0.029	0.035	No	No
55.	Jamboree Rd./Alton Pkwy.	Signal	0.760	C	0.837	D	0.796	C	0.878	D	0.036	0.041	No	No
56.	Jamboree Rd./Main St.	Signal	0.789	C	0.831	D	0.812	D	0.860	D	0.023	0.029	No	No
57.	Corporate Park/Barranca Pkwy.	Signal	0.354	A	0.579	A	0.370	A	0.605	B	0.016	0.026	No	No

Caltrans Analysis

Intersection		Signal Control	Opening Year				Opening Year plus Project				Delay Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS				
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	12.2	B	14.7	B	12.2	B	14.7	B	0.00	0.00	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	48.2	D	48.6	D	54.9	D	49.1	D	6.70	0.50	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	23.1	C	14.2	B	23.4	C	14.2	B	0.30	0.00	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	38.6	D	46.4	D	39.1	D	46.8	D	0.50	0.40	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	29.9	C	48.5	D	35.4	D	50.6	D	5.50	2.10	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	27.7	C	23.2	C	28.9	C	24.0	B	1.20	0.80	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	46.5	D	34.3	C	48.6	D	34.3	D	2.10	0.00	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	39.1	D	26.2	C	39.2	C	26.2	C	0.10	0.00	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	26.3	C	34.5	C	26.4	C	34.7	C	0.10	0.20	No	No

Source: Appendix K.

Notes: **Bold** = Exceeds LOS Standard; AWSC = All Way Stop Control; TWSC = Two Way Stop Control

the intersections of Red Hill Avenue/ Barranca Parkway (#30) cannot be guaranteed because they require approval and/or implementation by the City of Tustin. Because implementation of the mitigation measure cannot be guaranteed and may not be implemented by 2022, implementation of the Project would result in a significant and unavoidable impact at this intersection.

Table 5.14-9: Mitigated Opening Year 2022 Plus Project Peak Hour Intersection Levels of Service

Intersection	Opening Year		Opening Year Plus Project		Opening Year Plus Project (Mitigated)	
	PM Peak		PM Peak		PM Peak	
	V/C	LOS	V/C	LOS	V/C	LOS
30. Red Hill Ave./Barranca Pkwy.	0.908	E	1.007	F	0.907	E

Source: Appendix K.

Year 2040 Plus Project

Year 2040 plus Project traffic volumes were determined by adding the net new Project trips to the Year 2040 Without Project traffic volumes and accounting for the seven planned intersection improvements that would be implemented by 2040.

Consistent with the Existing Plus Project and Opening Year 2022 conditions, the Project driveway on Red Hill Avenue is forecast to operate at LOS F for vehicles exiting the site in the Year 2040 condition. The forecast delay of 49.2 seconds (5.3 vehicles) is anticipated to be experienced by drivers making an eastbound right-turn out of the Project site. Through vehicles on Red Hill Avenue would not be impacted. Drivers leaving the site in the a.m. peak hour could choose to utilize one of the two driveways on Warner Avenue and not wait at the Red Hill Avenue driveway. The signalized driveway on Warner Avenue is forecast to operate at LOS A and the unsignalized driveway on Warner Avenue is forecast to operate at LOS B in the Year 2040 plus Project condition. Both of the Warner Avenue driveways have adequate capacity to accommodate the additional traffic from the Red Hill Avenue driveway. Because this is an effect at an onsite driveway location, which could be avoided by use of other driveways, impacts at this location would be less than significant.

However, as detailed in Table 5.14-10, the Project would result in a significant cumulative impact at the following five intersections:

- Grand Avenue/Warner Avenue (#4) in the p.m. peak hour
- Red Hill Avenue/Warner Avenue (#25) in the pm peak hour
- Red Hill Avenue/Barranca Parkway (#30) in the p.m. peak hour
- Red Hill Avenue/Alton Parkway (#32) in the p.m. peak hour
- Tustin Ranch Road/Warner Avenue North (#47) in the p.m. peak hour

Improvements for impacted intersections have been identified and include the following:

- Grand Avenue/Warner Avenue (#4) (Santa Ana): Add a westbound protected right-turn overlap phase and prohibit northbound U-turns.
- Red Hill Avenue/Warner Avenue (#25) (Santa Ana/Tustin): Add a southbound protected right-turn overlap phase and prohibit eastbound U-turns.
- Red Hill Avenue/Barranca Parkway (#30) (Santa Ana/Tustin/Irvine): Add a westbound protected right-turn overlap phase and prohibit southbound U-turns.
- Red Hill Avenue/Alton Parkway (#32) (Santa Ana/Irvine): Add a westbound protected right-turn overlap phase and prohibit southbound U-turns.
- Tustin Ranch Road/Warner Avenue North (#47) (Tustin): Restripe the 3rd northbound through lane as a shared through-right lane and remove the northbound right turn overlap.

Table 5.14-10: Year 2040 Plus Project Peak Hour Intersection Levels of Service

Intersection		Signal Control	Year 2040				Year 2040 plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
1.	Grand Ave./Edinger Ave.	Signal	0.859	D	1.007	F	0.866	D	1.009	F	0.007	0.002	No	No
2.	Grand Ave./St. Andrew Pl.	Signal	0.398	A	0.595	A	0.401	A	0.598	A	0.003	0.003	No	No
3.	Grand Ave./St. Gertrude Pl.	Signal	0.486	A	0.583	A	0.490	A	0.590	A	0.004	0.007	No	No
4.	Grand Ave./Warner Ave.	Signal	0.759	C	1.018	F	0.775	C	1.051	F	0.016	0.033	No	Yes
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	0.511	A	0.504	A	0.511	A	0.504	A	0.000	0.000	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	0.825	D	0.832	D	0.832	D	0.835	D	0.007	0.003	No	No
7.	Grand Ave./Dyer Rd.	Signal	0.639	B	0.735	C	0.640	B	0.737	C	0.001	0.002	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	0.679	B	0.472	A	0.680	B	0.479	A	0.001	0.007	No	No
9.	Wright St./Warner Ave.	Signal	0.550	A	0.861	D	0.554	A	0.869	D	0.004	0.008	No	No
10.	Pullman St./Warner Ave.	Signal	0.499	A	0.591	A	0.510	A	0.595	A	0.011	0.004	No	No
11.	Pullman St./Dyer Rd.	Signal	0.582	A	0.807	D	0.585	A	0.807	D	0.003	0.000	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	0.767	C	0.699	B	0.768	C	0.700	C	0.001	0.001	No	No
13.	Newport Ave./Edinger Ave.	Signal	0.660	B	0.683	B	0.661	B	0.684	B	0.001	0.001	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	0.532	A	0.649	B	0.536	A	0.649	B	0.004	0.000	No	No
15.	Newport Ave./Valencia Ave.	Signal	0.696	B	0.708	C	0.699	B	0.712	C	0.003	0.004	No	No
16.	Red Hill Ave./El Camino Real	Signal	0.786	C	0.624	B	0.787	C	0.626	B	0.001	0.002	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	0.714	C	0.647	B	0.715	C	0.648	B	0.001	0.001	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	0.886	D	0.744	C	0.886	D	0.744	C	0.000	0.000	No	No
19.	Red Hill Ave./Nissan Rd.	Signal	0.664	B	0.733	C	0.664	B	0.733	C	0.000	0.000	No	No
20.	Red Hill Ave./Mitchell Ave.	Signal	0.687	B	0.712	C	0.687	B	0.705	C	0.000	-0.007	No	No
21.	Red Hill Ave./Walnut Ave.	Signal	0.750	C	0.823	D	0.750	C	0.823	D	0.000	0.000	No	No
22.	Red Hill Ave./Edinger Ave.	Signal	0.646	B	0.900	E	0.646	B	0.900	E	0.000	0.000	No	No
23.	Red Hill Ave./Valencia Ave.	Signal	0.816	D	0.772	C	0.810	D	0.773	C	-0.006	0.001	No	No
24.	Red Hill Ave./Victory Rd.	Signal	0.398	A	0.498	A	0.398	A	0.498	A	0.000	0.000	No	No
25.	Red Hill Ave./Warner Ave.	Signal	0.627	B	0.794	C	0.706	C	0.908	E	0.079	0.114	No	Yes
26.	Driveway 1/Warner Ave.	Signal	-	-	-	-	0.428	A	0.592	A	-	-	No	No
27.	Driveway 2/Warner Ave.	TWSC	-	-	-	-	13.9	B	15.1	C	-	-	No	No
28.	Red Hill Ave./Driveway 3	TWSC	-	-	-	-	49.2	E	17.1	C	-	-	No	No
29.	Red Hill Ave./Carnegie Ave.	Signal	0.449	A	0.519	A	0.485	A	0.544	A	0.036	0.025	No	No
30.	Red Hill Ave./Barranca Pkwy.	Signal	0.750	C	0.959	E	0.767	C	1.032	F	0.017	0.073	No	Yes
31.	Red Hill Ave./Deere Ave.	Signal	0.476	A	0.904	E	0.491	A	0.936	E	0.015	0.032	No	No
32.	Red Hill Ave./Alton Pkwy.	Signal	0.628	B	1.011	F	0.640	B	1.037	F	0.012	0.026	No	Yes
33.	Red Hill Ave./McGaw Ave.	Signal	0.537	A	0.825	D	0.550	A	0.839	D	0.013	0.014	No	No
34.	Red Hill Ave./MacArthur Blvd.	Signal	0.790	C	0.892	D	0.800	D	0.900	D	0.010	0.008	No	No
35.	Halladay St. E/Alton Ave.	TWSC	9.9	A	107.7	F	9.9	A	107.7	F	0.000	0.000	No	No
36.	Halladay St. W/Alton Ave.	TWSC	18.0	C	15.9	C	18.0	C	22.8	C	0.000	6.900	No	No
37.	Daimler St./Alton Pkwy.	AWSC	14.8	B	41.2	E	15.1	C	42.5	E	0.300	1.300	No	No
38.	MacArthur Blvd./Sky Park East	Signal	0.392	A	0.599	A	0.395	A	0.605	B	0.003	0.006	No	No

Intersection		Signal Control	Year 2040				Year 2040 plus Project				V/C Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS	V/C or Delay	LOS				
39.	MacArthur Blvd./Main St.	Signal	0.614	B	0.788	C	0.618	B	0.789	C	0.004	0.001	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	0.799	C	0.766	C	0.802	D	0.769	C	0.003	0.003	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	0.595	A	0.761	C	0.598	A	0.761	C	0.003	0.000	No	No
42.	Reserve Center Driveway/Warner Ave.	Signal	0.305	A	0.429	A	0.323	A	0.441	A	0.018	0.012	No	No
43.	Armstrong Ave./Warner Ave.	Signal	0.314	A	0.417	A	0.321	A	0.442	A	0.007	0.025	No	No
44.	Armstrong Ave./Barranca Pkwy.	Signal	0.618	B	0.843	D	0.631	B	0.848	D	0.013	0.005	No	No
45.	Legacy Rd./Warner Ave.	Signal	0.233	A	0.358	A	0.245	A	0.374	A	0.012	0.016	No	No
46.	Tustin Ranch Rd./Valencia Ave.	Signal	0.695	B	0.856	D	0.696	B	0.860	D	0.001	0.004	No	No
47.	Tustin Ranch Rd./Warner Ave. N	Signal	0.575	A	1.006	F	0.582	A	1.016	F	0.007	0.010	No	Yes
48.	Tustin Ranch Rd./Warner Ave. S	Signal	0.821	D	0.734	C	0.821	D	0.743	C	0.000	0.009	No	No
49.	Tustin Ranch Rd./Park Ave.	Signal	1.050	F	1.135	F	1.050	F	1.136	F	0.000	0.001	No	No
50.	Tustin Ranch Rd./Barranca Pkwy.	Signal	0.822	D	1.002	F	0.823	D	1.007	F	0.001	0.005	No	No
51.	Von Karman Ave./Alton Pkwy.	Signal	0.806	D	0.980	E	0.809	D	0.981	E	0.003	0.001	No	No
52.	Park Ave./Warner Ave.	Signal	0.726	C	0.907	E	0.736	C	0.911	E	0.010	0.004	No	No
53.	Millikan Ave./Barranca Pkwy.	Signal	0.566	A	0.778	C	0.571	A	0.787	C	0.005	0.009	No	No
54.	Jamboree Rd./Barranca Pkwy.	Signal	0.887	D	1.031	F	0.892	D	1.038	F	0.005	0.007	No	No
55.	Jamboree Rd./Alton Pkwy.	Signal	0.825	D	0.935	E	0.826	D	0.936	E	0.001	0.001	No	No
56.	Jamboree Rd./Main St.	Signal	0.828	D	0.877	D	0.828	D	0.878	D	0.000	0.001	No	No
57.	Corporate Park/Barranca Pkwy.	Signal	0.450	A	0.674	B	0.457	A	0.684	B	0.007	0.010	No	No

Caltrans Analysis

Intersection		Signal Control	Year 2040				Year 2040 plus Project				Delay Change		Impact?	
			AM Peak		PM Peak		AM Peak		PM Peak		AM	PM	AM	PM
			Delay ³	LOS ²	Delay ³	LOS ²	Delay ³	LOS ²	Delay ³	LOS ²				
5.	Grand Ave./SR 55 SB Off-Ramp	Signal	12.1	B	14.9	B	12.9	B	14.9	B	0.80	0.00	No	No
6.	SR 55 SB Ramps/Dyer Rd.	Signal	40.1	D	55.8	E	48.4	D	56.3	E	8.30	0.50	No	No
8.	SR 55 NB Ramps/Dyer Rd.	Signal	24.6	C	13.5	B	27.1	C	13.6	B	2.50	0.10	No	No
12.	SR 55 SB Ramps/Edinger Ave.	Signal	41.2	D	47.2	D	41.3	D	54.7	D	0.10	7.50	No	No
14.	Newport Ave./SR-55 NB Ramp-Del Amo Ave.	Signal	33.2	C	31.7	C	35.8	D	32.1	C	2.60	0.40	No	No
17.	Red Hill Ave./Interstate 5 NB Ramps	Signal	27.3	C	22.9	C	28.3	C	23.4	C	1.00	0.50	No	No
18.	Red Hill Ave./Interstate 5 SB Ramps	Signal	47.5	D	43.5	D	47.5	D	49.8	D	0.00	6.30	No	No
40.	MacArthur Blvd./Interstate 405 NB Ramps	Signal	25.5	C	15.7	B	25.7	C	15.7	B	0.20	0.00	No	No
41.	MacArthur Blvd./Interstate 405 SB Ramps	Signal	26.8	C	31.0	C	26.9	C	31.1	C	0.10	0.10	No	No

Source: Appendix K.

Notes: **Bold** = Exceeds LOS Standard; AWSC = All Way Stop Control; TWSC = Two Way Stop Control

As shown in Table 5.14-11, with implementation of the identified improvements, all impacts would be reduced to a less than significant level. However, improvements at the intersections of Red Hill Avenue/Warner Avenue (#25), Red Hill Avenue/Barranca Parkway (#30), Red Hill Avenue/Alton Parkway (#32), and Tustin Ranch Road/Warner Avenue North (#47) cannot be guaranteed because they require approval and/or implementation by the City of Tustin or the City of Irvine. In addition, the improvement at the Grand Avenue/Warner Avenue (#4) is required as a result of a cumulative impact, as the intersection operates with unsatisfactory LOS in the baseline condition. The Project would be responsible for a fair share of the improvement; however, there is no currently planned improvement at the location, and it is unknown if the Grand Avenue/Warner Avenue improvement would be implemented by 2040. Therefore, implementation of the Project would result in a significant and unavoidable impact under the Year 2040 Plus Project condition at these five intersections.

Table 5.14-11: Year 2040 Peak Hour Levels of Service with Mitigation

Intersection		Year 2040 Plus Project				2040 Plus Project (Mitigated)			
		AM Peak		PM Peak		AM Peak		PM Peak	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
4.	Grand Ave./Warner Ave.	0.775	C	1.051	F	0.77	C	0.993	E
25.	Red Hill Ave./ Warner Ave.	0.706	C	0.908	E	0.706	C	0.893	D
30.	Red Hill Ave./Barranca Pkwy.	0.767	C	1.032	F	0.767	C	0.931	E
32.	Red Hill Ave./Alton Pkwy.	0.64	B	1.037	F	0.64	B	0.979	E
47.	Tustin Ranch Rd./Warner Ave. N	0.582	A	1.016	F	0.597	A	0.787	C

Source: Appendix K.

Notes: **Bold** = Exceeds LOS Standard

Transit, Bicycle, and Pedestrian Facilities

As described previously, the Project site is currently served by OCTA Bus Routes 71 (Red Hill) and 72 (Warner), as well as Metrolink Stationlink Route 472 (Red Hill). Bus routes 71 and 72 provide service seven days a week. Route 472 provides service Monday thru Friday. Other Bus Routes servicing areas within the Project area are OCTA bus routes 55, 59, 70, 76, 86, Intracounty OC Express Route 213/A, Metrolink Stationlink Route 463, and the IShuttle 400A, 401B, and 405F. The existing bus services would allow project site residents and employees to convenient access to transit. The proposed Project would not alter or conflict with existing bus stops and schedules, and impacts related to OCTA transit services would not occur.

There are several roadways in the Project vicinity that currently have bicycle lanes, which include: Red Hill Avenue between Barranca Parkway and Reynolds Avenue, Warner Avenue east of Red Hill Avenue, Tustin Ranch Road, Von Karman Avenue, Jamboree Road between Barranca Parkway and Main Street, Edinger Avenue between Red Hill Avenue and Newport Avenue, on the south side of Barranca Parkway west of Jamboree Road, Alton Parkway between Red Hill Avenue and Jamboree Road, and on Main Street. Additionally, sidewalks currently exist adjacent to the site along both Red Hill Avenue and Warner Avenue.

The Project would not involve any off-site improvements that would remove the existing bicycle lanes or result in any identified impacts to bicycle routes. The existing bicycle routes would provide bicycle transportation opportunities for residents and employees of the Project site. The Project would not conflict with any bicycle facilities. Similarly, the Project site is bound by sidewalks along Redhill Avenue and Warner Avenue. The proposed Project would retain the existing sidewalks, which would facilitate pedestrian use and walking to nearby locations. Therefore, the proposed Project would also not conflict with pedestrian facilities. Overall, Project impacts to transit, bicycle, and pedestrian facilities would be less than significant.

IMPACT TR-2: THE PROJECT WOULD NOT CONFLICT OR BE INCONSISTENT WITH CEQA GUIDELINES SECTION 15064.3, SUBDIVISION (B).

Less than Significant Impact. The Senate Bill 743 was signed by the Governor in 2013 and directed the Governor's Office of Planning and Research (OPR) to identify alternative metrics for evaluating transportation impacts under CEQA. Recently adopted changes to the CEQA Guidelines include a new section

(15064.3) that specifies that Vehicle Miles Traveled (VMT) is the most appropriate measure of transportation impacts. A separate Technical Advisory issued by OPR provides additional technical details on calculating VMT and assessing transportation impacts for various types of projects. The revised CEQA guidelines take effect July 1, 2020.

The City of Santa Ana has prepared a guidance document for analysis of VMT and assessment of transportation impacts under SB743. The City's document provides screening thresholds to assess whether further VMT analysis is required based on project location, size, or consistency with the SCAG Regional Transportation Plan/Sustainable Communities Strategy. According to the City's screening thresholds, and general guidance from OPR, and CEQA Guidelines Section 15064.3(b)(1), a project that is located within a Transit Priority Area or a High-Quality Transit Area is presumed to have a less than significant impact to VMT.

As described previously, the Project site is served by OCTA routes 71 (Warner Avenue), 72 (Red Hill Avenue), and 472 (Red Hill Avenue). Each of these routes operates approximately every 30 minutes during peak hours in each direction, which results in one stop every 6 minutes during the a.m. and p.m. peak hours. Additionally, SCAG GIS data identifies that the Project site is located within a 2040 High Quality Transit Area, as shown in Figure 5.14-2.

Because the Project site is adjacent to existing transit service with an interval of approximately 6 minutes during the peak commute hours and is located within a SCAG identified 2040 High-Quality Transit Area, the Project would result in a less than a significant impact related to VMT.

IMPACT TR-3: THE PROJECT WOULD NOT SUBSTANTIALLY INCREASE HAZARDS DUE TO A GEOMETRIC DESIGN FEATURE (E.G., SHARPT CURVES OR DANGEROUS INTERSECTIONS) OR INCOMPATIBLE USES (E.G., FARM EQUIPMENT).

Less than Significant Impact. The Project includes development of mixed uses that include residential, retail/restaurant commercial, and open space recreation. The Project includes community type uses and does not include any incompatible uses, such as farm equipment. The proposed Project would be accessed from one driveway on Red Hill Avenue and two driveways on Warner Avenue that provide direct access to parking areas.

The Project would also not increase any hazards related to a design feature. All of the proposed improvements would be required to be installed in conformance with City design standards. The City's construction permitting process includes review Project site plans to ensure that no potentially hazardous transportation design features would be introduced by the Project. For example, sight distance at each Project driveway would be reviewed for conformance with City of Santa Ana sight distance standards at the time of permitting approvals for grading, landscape, onsite circulation construction, and street improvement plans. As a result, impacts related to vehicular circulation design features would be less than significant.

IMPACT TR-4: THE PROJECT WOULD NOT RESULT IN INADEQUATE EMERGENCY ACCESS.

Less than Significant Impact.

Construction

The proposed construction activities, including equipment and supply staging and storage, would occur within and adjacent to the Project area and would not restrict access of emergency vehicles to the Project site or adjacent areas. The roadway improvements and installation of driveways that would be implemented during construction of the proposed Project could require the temporary closure of travel lanes, but full roadway closure and traffic detours are not expected to be necessary. However, construction activities may temporarily restrict vehicular traffic that could increase hazards. Therefore, the construction activities would

be required to implement measures to facilitate the passage of persons and vehicles through/around any required temporary road restrictions, and ensure the safety of passage in accordance with Section 503 of the California Fire Code (Title 24, California Code of Regulations, Part 9) and the City of Santa Ana Fire Code included as Municipal Code Chapter 14, which would be ensured through the City's permitting process. Thus, implementation of the Project through the City's permitting process would ensure existing regulations are adhered to and would reduce potential construction related emergency access impacts to a less than significant level.

Operation

As described previously, the Project includes one driveway on Red Hill Avenue and two driveways on Warner Avenue that provide direct access to parking areas. As described previously, these driveways would provide adequate and safe circulation to and from the Project site and would provide a several routes for emergency responders to access different portions of the Project site and surrounding areas.

Additionally, during operation of the Project, building tenants would be required to maintain adequate emergency access for emergency vehicles as required and verified by the City and the Orange County Fire Authority (OCFA) through operational permitting and inspections. Because the Project is required to comply with all applicable City codes, as verified by the City and OCFA potential impacts related to inadequate emergency access would be less than significant.

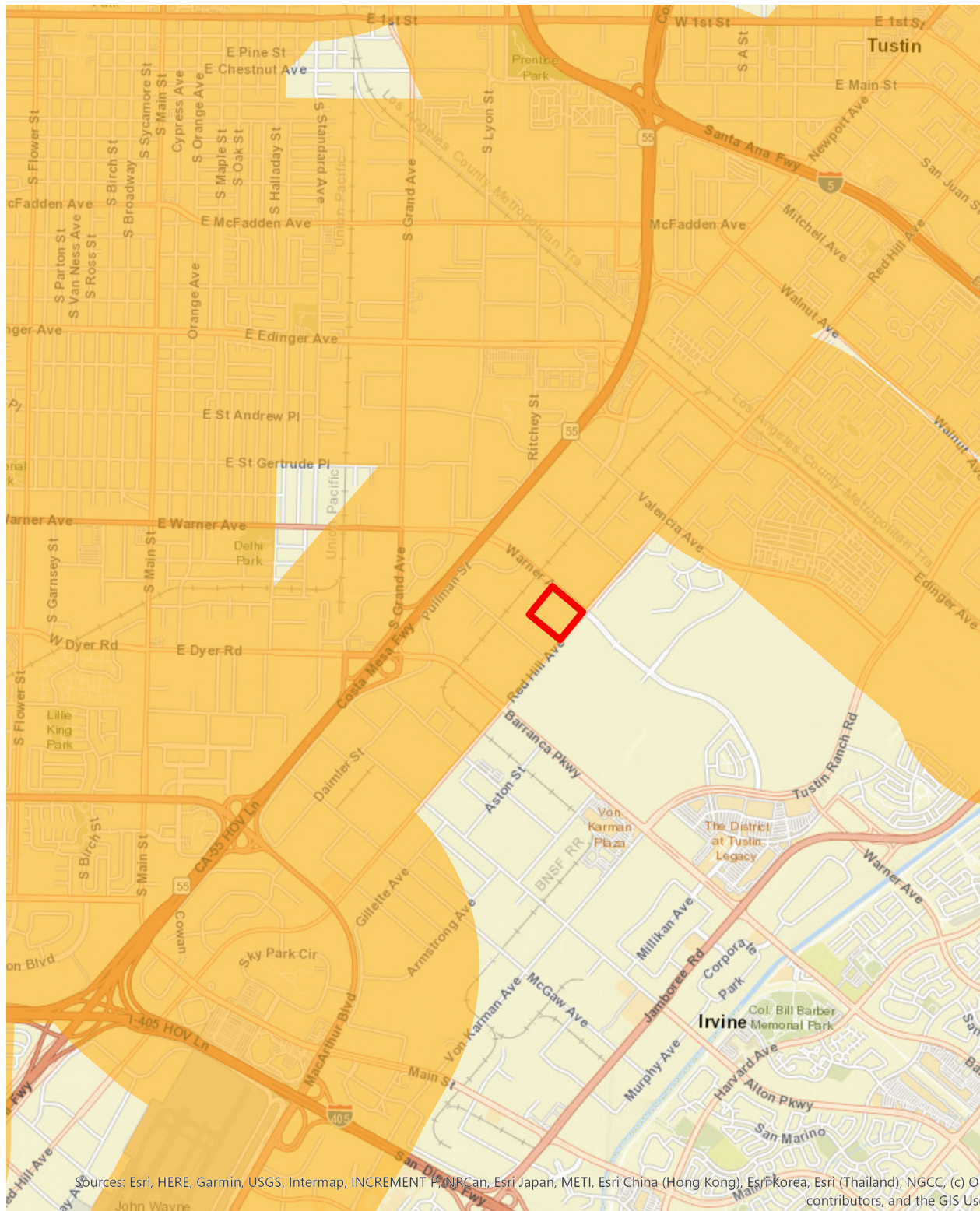
5.14.7 CUMULATIVE IMPACTS

The cumulative traffic study area for the proposed Project includes the 57 intersections that are evaluated above. This includes portions of the Cities of Santa Ana, Tustin, and Irvine. The traffic study area was selected based upon, local access to the Project site and study area, the Project's trip generation, likely Project distribution patterns, a review of existing operations, and coordination with the Cities of Santa Ana, Tustin, and Irvine traffic engineering staffs. The related projects within the cumulative study area for traffic are listed on Table 5.14-7 and shown on Figure 5-1. The proposed Project would add new vehicle trips to the cumulative geographic area. Because the Project's anticipated opening year is 2022, the traffic analysis detailed above analyzed both Year 2022 and Year 2040 traffic conditions, which took into account the cumulative projects and regional growth. As detailed previously, the proposed Project would result in impacts in the cumulative 2040 condition. Mitigation measures have been identified, which would reduce impacts to a less than significant level; however, either implementation of the improvements requires approval or implementation from another jurisdiction, which is out of the control of the City of Santa Ana, or no planned improvement exists, and the timing of the improvement is unknown. Therefore, the proposed Project would result in a cumulatively considerable impact related to traffic, and cumulative traffic impacts would be significant and unavoidable.

5.14.8 EXISTING STANDARD CONDITIONS AND PLANS, PROGRAMS, OR POLICIES

- Orange County Congestion Management Program
- SCAG 2016 - 2040 Regional Transportation Plan/Sustainable Communities Strategy
- City of Santa Ana General Plan Circulation Element
- City of Santa Ana Municipal Code

High Quality Transit Area Location



Project Site



High Quality Transit Areas



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5.14.2 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Without mitigation, Impact TR-1 would be **potentially significant**:

Upon implementation of regulatory requirements, Impacts TR-2 through TR-4 would be less than significant.

5.14.9 MITIGATION MEASURES

Mitigation Measure TR-1: Grand Avenue/Warner Avenue (#4) (Santa Ana): The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring payment of a fair share contribution to the improvement to add an eastbound protected right-turn overlap phase and prohibit northbound U-turns at the intersection of Grand Avenue/Warner Avenue.

Mitigation Measure TR-2: Red Hill Avenue/Warner Avenue (#25) (Santa Ana/Tustin): The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring payment of the full cost or implementation of an additional westbound protected right-turn overlap phase and to prohibit southbound U-turns. The installation of this improvement is subject to the approval of the City of Tustin.

Mitigation Measure TR-3: Red Hill Avenue/Barranca Parkway (#30) (Santa Ana/Tustin/Irvine): The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring payment of the full cost or implementation of an additional westbound protected right-turn overlap phase and to prohibit southbound U-turns. The installation of this improvement is subject to the approval of the Cities of Tustin and Irvine.

Mitigation Measure TR-4: Red Hill Avenue/Alton Parkway (#32) (Santa Ana/Irvine): The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring payment of the full cost or implementation of a westbound protected right-turn overlap phase and to prohibit southbound U-turns. The installation of this improvement is subject to the approval of the City of Irvine.

Mitigation Measure TR-5: Tustin Ranch Road/Warner Avenue North (#47) (Tustin): The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring payment of a fair share contribution to restripe the 3rd northbound through lane as a shared through-right lane and remove the northbound right turn overlap. The installation of this improvement is subject to the approval of the City of Tustin.

5.14.10 LEVEL OF SIGNIFICANCE AFTER MITIGATION

For Impact TR-1, Mitigation Measures TR-1 through TR-5 are included. However, improvements at four of the intersections cannot be guaranteed by the City of Santa Ana because they require approval and/or implementation by the City of Tustin or the City of Irvine. In addition, the improvement at the fifth intersection is not currently planned, and it is unknown if it would be implemented by 2040. Therefore, implementation of the Project would result in a significant and unavoidable impact.

Impacts related Impacts TR-2 through TR-4 would be less than significant.

REFERENCES

Caltrans Traffic Impact Study Guidelines, December 2002. Accessed:
https://nacto.org/docs/usdg/guide_preparation_traffic_impact_studies_caltrans.pdf

The Bowery Traffic Impact Analysis (TIA 2019), prepared by EPD Solutions, Inc., 2019.