Attachment No. PC 6

Traffic Study – September 2017

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Traffic Impact Study

for:

The Koll Center Residences
In the City of Newport Beach

Prepared for:
The City of Newport Beach

September 2017

Kimley»Horn

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TRAFFIC IMPACT STUDY
FOR THE
KOLL CENTER RESIDENCES

Prepared for:

The City of Newport Beach

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September 2017

THE KOLL CENTER RESIDENCES
TRAFFIC IMPACT STUDY

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

TRAFFIC IMPACT STUDY
FOR THE
THE KOLL CENTER RESIDENCES

INTRODUCTION

This Traffic Impact Study has been prepared to provide an evaluation of the traffic-related impacts associated with the proposed Koll Center Residences project. This report has been prepared in accordance with the City of Newport Beach Traffic Phasing Ordinance (TPO) traffic impact study requirements, County of Orange Congestion Management Program (CMP) requirements, and in support of the environmental documentation for the project, per the California Environmental Quality Act (CEQA) requirements.

PROJECT DESCRIPTION

The Koll Center Residences project site is located at the southeast corner [1] of Birch Street and Von Karman Avenue in the Airport Area of the City of Newport Beach. A vicinity map is provided on **Figure 1**.

Existing Site Uses and Access

The project site is located within the surface parking areas serving the existing Koll Center Newport office park. Koll Center Newport consists of general office buildings with surface parking and a parking structure. Except for the 4440 Von Karman office building, the existing office buildings located within the boundaries of the project site (4490 Von Karman and 4910 Birch), or immediately contiguous to the site (5000 Birch, 4340 Von Karman, and 4350 Von Karman) are not a part of the proposed development. Access to Koll Center Newport is currently provided by two driveways on Von Karman Avenue, and three driveways on Birch Street. All driveways are currently unsignalized and gated. The existing Koll Center Newport site is shown on **Figure 2**.

Proposed Site Uses and Access

The Koll Center Residences project consists of the construction of 260 luxury residential condominiums, 3,000 square feet of ground-floor retail uses, a one-acre public park, a parking structure, and the reconfiguration of some of the existing surface parking areas. The proposed residential units would be in three, 13-story buildings, with 2 levels of above-grade parking and 2 to 3 levels of below-grade parking. The proposed one-acre public park would be located adjacent to the easterly entrance to the project site from Birch Street. A copy of the project site plan is provided on **Figure 3**.

[1] As shown on Figure 1, the streets adjacent to the project site are oriented on a diagonal. For purposes of this report, Jamboree Road, MacArthur Boulevard, and Von Karman Avenue are considered to be the north-south streets, and Birch Street is the east-west street.

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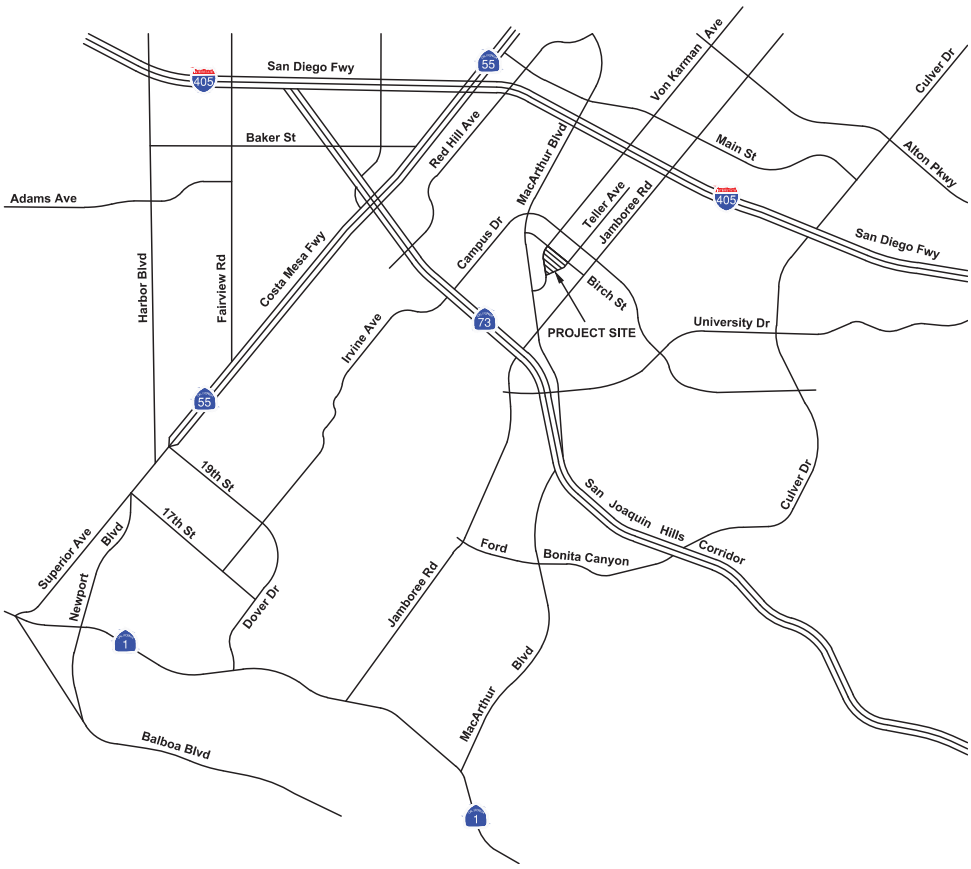

FIGURE 1
VICINITY MAP

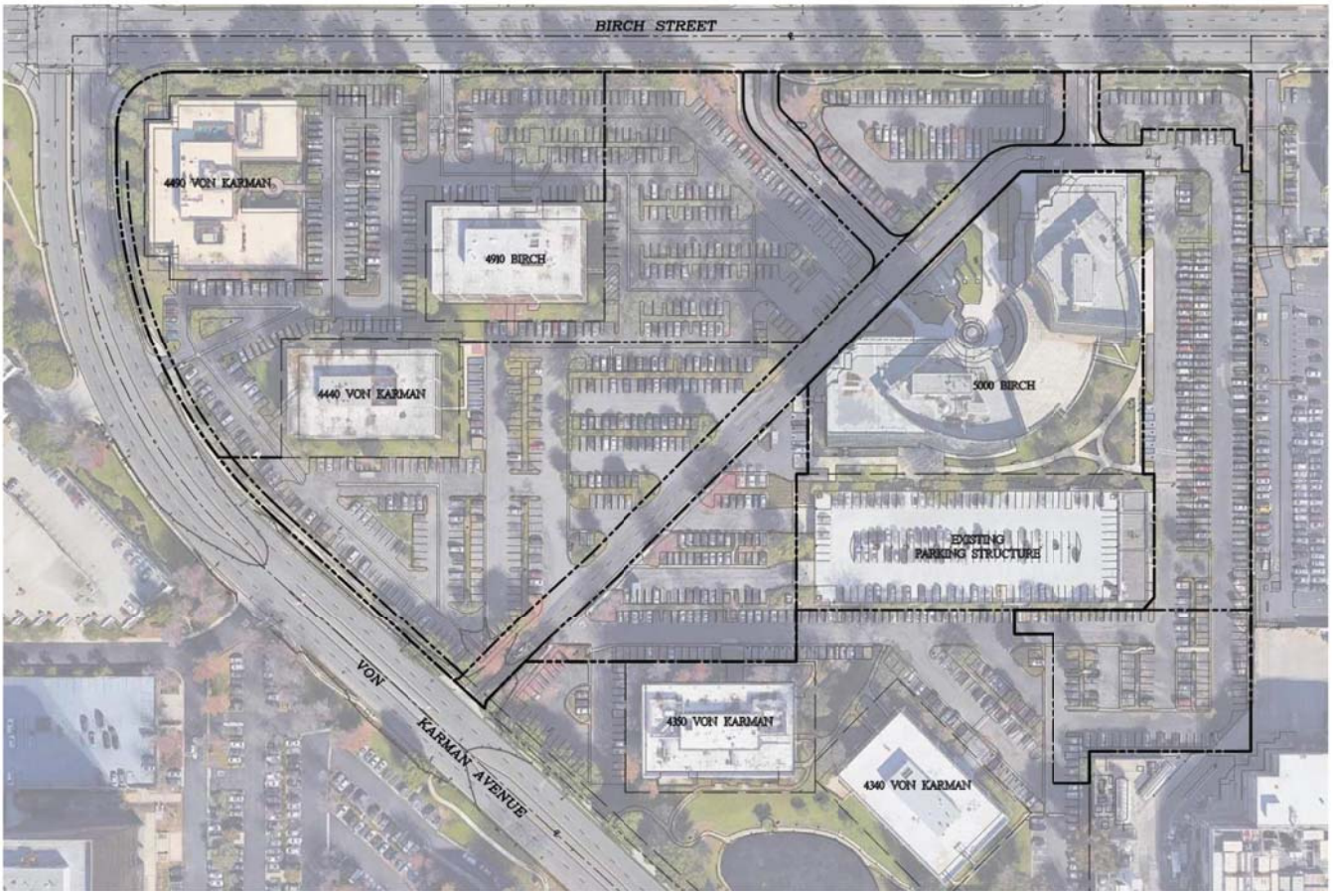

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FIGURE 2
EXISTING PROJECT SITE

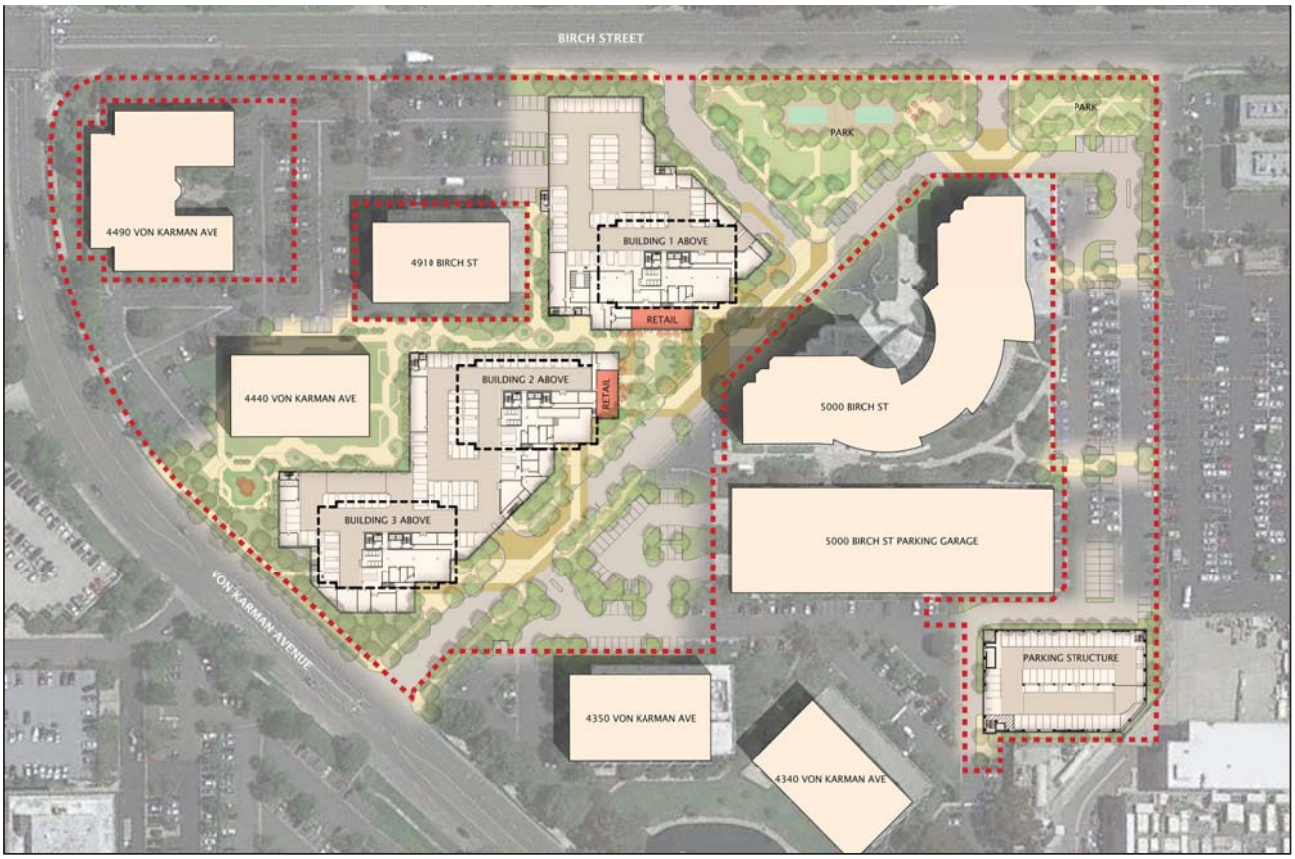

FIGURE 3
PROJECT SITE PLAN

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After completion, the project would take access via two access points on Von Karman Avenue (one full access point, and one for egress only) and three full access points on Birch Street.

To allow for the construction of the proposed project, some of the existing surface parking areas and the common landscape areas would be demolished. All project parking would be provided in parking garages underneath the buildings, with additional on-site surface parking for the proposed one-acre public park and retail uses. Existing Koll Center Newport office parking displaced by the project construction activities and by the proposed development would be replaced with the construction of a new 506-space parking structure, to be located at the southeast corner of the 5000 Birch office tower's parking structure, and designated office parking spaces in the Building 1 parking structure. A separate construction parking management plan is being prepared.

STUDY METHODOLOGY

Study Area

This Traffic Impact Study for the Koll Center Residences project includes evaluation of morning and evening peak hour operations at the 29 existing intersections listed on page 7. The study intersections consist of a combination of intersections in the City of Newport Beach and the adjoining City of Irvine.

The study area and study intersection list reflect input received from the cities of Newport Beach and Irvine. The locations of the study intersections are shown on **Figure 4**. Of the 29 study intersections, 12 are controlled and maintained by the City of Irvine and 15 are controlled and maintained by the City of Newport Beach. The two I-405 Freeway ramp intersections at Jamboree Road are controlled and maintained by Caltrans.

Each intersection has been analyzed using the methodology and parameters employed by the city in which the intersection is located. For "shared" intersections on the city boundary, the intersection analysis is based on the methodology used by the City that controls and maintains the signal. A discussion of the analysis methodology and significance criteria for each city is provided in the next section.

Of the 29 study intersections, two intersections are located on State Highways, and are therefore controlled and maintained by Caltrans. A separate analysis of the State Highway intersections using the analysis methodology specified in the *Caltrans Guide for the Preparation of Traffic Impact Studies* is provided in a separate section of this report.

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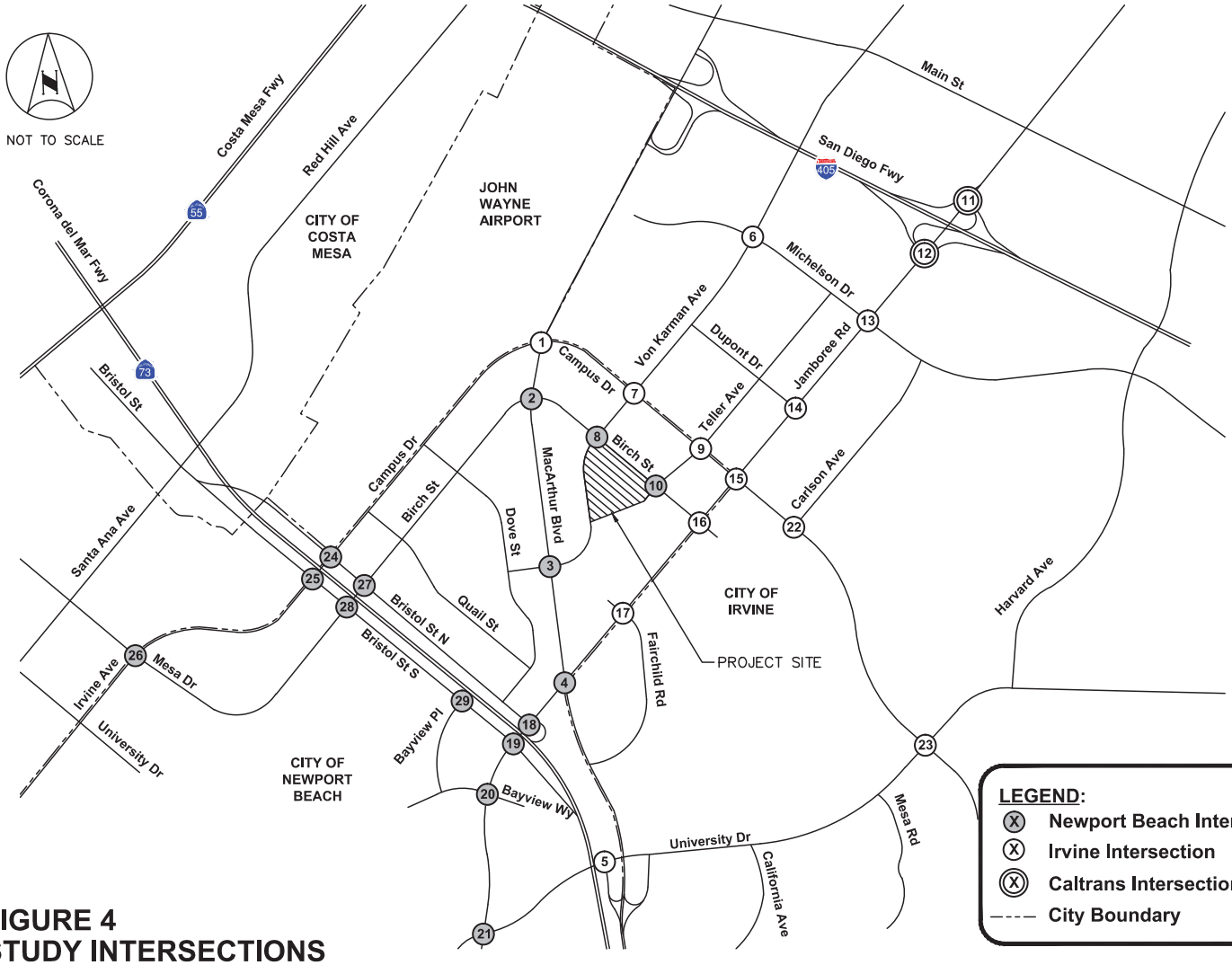

FIGURE 4
STUDY INTERSECTIONS

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Study Intersections

No.	Intersection	Jurisdiction [1]	Traffic Control
1	MacArthur Boulevard at Campus Drive [1]	Irvine	Signal
2	MacArthur Boulevard at Birch Street	Newport Beach	Signal
3	MacArthur Boulevard at Von Karman Avenue	Newport Beach	Signal
4	MacArthur Boulevard at Jamboree Road [1, 2]	Newport Beach	Signal
5	MacArthur Boulevard SB Ramp at University Drive	Irvine	Signal
6	Von Karman Avenue at Michelson Drive	Irvine	Signal
7	Von Karman Avenue at Campus Drive [1]	Irvine	Signal
8	Von Karman Avenue at Birch Street	Newport Beach	Signal
9	Teller Avenue at Campus Drive [1]	Irvine	Signal
10	Teller Avenue at Birch Street	Newport Beach	2-way Stop
11	Jamboree Road at I-405 NB Ramps [2]	Caltrans	Signal
12	Jamboree Road at I-405 SB Ramps [2]	Caltrans	Signal
13	Jamboree Road at Michelson Drive	Irvine	Signal
14	Jamboree Road at Dupont Drive	Irvine	Signal
15	Jamboree Road at Campus Drive [1]	Irvine	Signal
16	Jamboree Road at Birch Street [1]	Irvine	Signal
17	Jamboree Road at Fairchild Drive [1]	Irvine	Signal
18	Jamboree Road at Bristol Street N	Newport Beach	Signal
19	Jamboree Road at Bristol Street S	Newport Beach	Signal
20	Jamboree Road at Bayview Way	Newport Beach	Signal
21	Jamboree Road at University Drive	Newport Beach	Signal
22	Carlson Avenue at Campus Drive	Irvine	Signal
23	University Drive at Campus Drive	Irvine	Signal
24	Bristol Street N at Campus Drive	Newport Beach	Signal
25	Bristol Street S at Irvine Avenue / Campus Drive	Newport Beach	Signal
26	Irvine Avenue at Mesa Drive	Newport Beach	Signal
27	Birch Street at Bristol Street N	Newport Beach	Signal
28	Birch Street at Bristol Street S	Newport Beach	Signal
29	Bayview Place at Bristol Street S	Newport Beach	Signal

[1] For "shared" intersections on the boundary between the two cities, the city listed indicates the city that maintains and controls the signal. Freeway ramp intersections and intersections on a State Highway are maintained and operated by Caltrans.

[2] Designated County of Orange Congestion Management Program (CMP) intersection.

Analysis Methodology

Intersection analysis for all signalized intersections has been conducted using the Intersection Capacity Utilization (ICU) methodology, which is the methodology utilized by both cities, as well as the Orange County Congestion Management Program (CMP). Intersections that are located at a State Highway intersection are also analyzed in accordance with Caltrans requirements, using a separate methodology, as discussed later in this report.

The ICU methodology provides a comparison of the theoretical hourly vehicular capacity of an intersection to the number of vehicles actually passing through that intersection during any given hour. The ICU calculation assumes an hourly per-lane capacity for each lane through the intersection, and a clearance factor to account for the effect of yellow and red signal phases.

Variations in analysis input parameters between the City of Newport Beach and the City of Irvine have been accounted for in the analysis. The following presents the ICU parameters for each of the cities.

ICU Parameter	City of Newport Beach	City of Irvine
Saturation Flow Rate / Lane	1,600 vehicles per hour (vph)	1,700 vehicles per hour (vph)
Clearance Interval	0	.05 of cycle length
Right-turn-on-red allowed [1]	NA	Yes
ATMS Credit [2]	NA	.05
Critical Movement / ICU calculation	3 decimals for each critical movement, summed and rounded to 2 decimals for the final ICU for the TPO analysis, and 3 decimals for the CEQA analysis	2 decimals for each critical movement and final ICU

[1] Right-turn-on-red is allowed from exclusive right-turn lanes. For the City of Irvine, "unofficial" right-turn lanes (known as a de facto right-turn lane) are assumed in the ICU calculation if 19 feet of travel lane exists from lane stripe to edge of roadway, and curbside parking is prohibited during peak periods.

[2] ATMS is an advanced traffic signal management system employed by the City of Irvine to allow the control of signal operations in real-time response to traffic conditions at the intersection. Intersections with the ATMS equipment installed are given a 0.05 capacity credit. The ATMS credit is not applied to intersections located within the Irvine Business Complex (IBC). One study intersection (University Drive at Campus Drive) has the ATMS equipment installed. The ATMS credit is applied in all study scenarios.

Intersection analysis for unsignalized intersections has been conducted using the Highway Capacity Manual (HCM) methodology, which returns a delay value, expressed in terms of the average seconds of delay per vehicle.

Operating conditions for both ICU and HCM methodologies are expressed in terms of “Level of Service” which is also referred to by its acronym, LOS. The ICU calculation returns a volume-to-capacity (V/C) ratio that translates into a corresponding Level of Service, ranging from LOS A, representing uncongested, free-flowing conditions; to LOS F, representing congested, over-capacity conditions.

The HCM methodology returns a delay value, expressed in terms of the average seconds of delay per vehicle, which also corresponds to a Level of Service measure. A summary description of each Level of Service and the corresponding V/C ratio or delay is provided on the following chart.

LEVEL OF SERVICE DESCRIPTIONS			
Level of Service	**Signalized: ICU V/C Ratio**	**Unsignalized: HCM [1] Delay (sec)**	**Description**
A	0.00 - 0.60	≤10	EXCELLENT – No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.61 - 0.70	> 10 and ≤ 15	VERY GOOD – An occasional approach phase is fully utilized; drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 - 0.80	> 15 and ≤ 25	GOOD – Occasionally drivers may have to wait through more than one red light; back-ups may develop behind turning vehicles.
D	0.81 - 0.90	> 25 and ≤ 35	FAIR – Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive back-ups.
E	0.91 - 1.00	> 35 and ≤ 50	POOR – Represents the most vehicles that the intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	> 50	FAILURE – Back-ups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

[1] Source: Highway Capacity Manual, 2010

Performance Criteria

The City of Newport Beach target Level of Service (LOS) for peak hour operation of signalized intersections is LOS D or better, except for designated intersections within the Airport Area shared with the City of Irvine, where LOS E is acceptable. The shared Airport Area intersections include:

No.	Intersection
1.	MacArthur Boulevard at Campus Drive [1]
4.	MacArthur Boulevard at Jamboree Road [2]
7.	Von Karman Avenue at Campus Drive [1]
9.	Teller Avenue at Campus Drive [1]
15.	Jamboree Road at Campus Drive [1]
16.	Jamboree Road at Birch Street [1]
17.	Jamboree Road at Fairchild Road [1]

[1] Will be analyzed using the City of Irvine ICU parameters

[2] Will be analyzed using the City of Newport Beach ICU parameters

In the City of Irvine, the target Level of Service is LOS D, except where the intersection is located within the Irvine Business Complex (IBC) or the Irvine Spectrum area. For these intersections, the target Level of Service is E. The following study intersections are located in the IBC:

No.	Intersection
1.	MacArthur Boulevard at Campus Drive [1]
4.	MacArthur Boulevard at Jamboree Road [2]
6.	Von Karman Avenue at Michelson Drive [1]
7.	Von Karman Avenue at Campus Drive [1]
9.	Teller Avenue at Campus Drive [1]
11.	Jamboree Road at I-405 Northbound Ramps [1]
12.	Jamboree Road at I-405 Southbound Ramps [1]
13.	Jamboree Road at Michelson Drive [1]
14.	Jamboree Road at Dupont Drive [1]
15.	Jamboree Road at Campus Drive [1]
17.	Jamboree Road at Fairchild Road [1]
22.	Campus Drive at Carlson Avenue [1]

[1] Will be analyzed using the City of Irvine ICU parameters

[2] Will be analyzed using the City of Newport Beach ICU parameters

Threshold of Significance

City of Newport Beach

To determine whether or not the addition of project-generated trips at a signalized study intersection results in a significant impact, the City of Newport Beach has adopted the following thresholds of significance:

- A significant impact would occur when the addition of project-generated trips causes the Level of Service at a study intersection to deteriorate from an acceptable (LOS D, except for intersections on a CMP facility, or designated intersections in the Airport Area, where LOS E is acceptable) to a deficient Level of Service.

- A significant impact would occur when the addition of project-generated trips increases the ICU at a study intersection by one percent or more (v/c increases by 0.010 or more), worsening a projected baseline condition of LOS E or F.

For unsignalized intersections operating at an unacceptable Level of Service, a signal warrant analysis will be conducted to determine if a signal is warranted. The signal warrant analysis will be conducted according to the California Manual of Uniform Traffic Control Devices (MUTCD), Warrant 3 – Peak Hour warrant parameters, using the peak hour intersection volumes.

City of Irvine

All of the study intersections in the City of Irvine are signalized. To determine whether or not the addition of project-generated trips at a signalized study intersection results in a significant impact, the City of Irvine has adopted the following significance threshold:

- A significant impact would occur when the intersection exceeds the acceptable Level of Service (LOS D except for intersections located in the IBC or on a CMP facility, where LOS E is acceptable) in the baseline condition and the impact of the development is greater than or equal to two percent (v/c increase by 0.02 or more), or;

- The project increases the ICU by one percent or more (v/c increases by 0.01 or more) at a study intersection, causing it to become deficient.

Should a significant impact occur, project mitigation would be required to bring the intersection back to baseline conditions, at a minimum.

Caltrans

- A significant project impact occurs at a State Highway study intersection when the addition of project-generated trips causes the peak hour Level of Service of the study intersection to change from acceptable operation (LOS A, B, or C) to deficient operation (LOS D, E, or F).

Study Scenarios

Each of the study intersections has been analyzed for the following scenarios:

- Existing Conditions
- Existing Plus Project
- TPO Analysis Year 2022 Without Project
- TPO Analysis Year 2022 With Project
- CEQA Analysis Year 2022 Without Project
- CEQA Analysis Year 2022 With Project

EXISTING TRANSPORTATION SYSTEM

Roadway Characteristics

Regional access to the project site is provided by the Corona del Mar Freeway/San Joaquin Hills Transportation Corridor (SR-73), located less than one mile to the south of the project area, and by the San Diego Freeway (I-405), located approximately 1.5 miles north of the project area. The proposed development would take access to the surrounding street system via connections to Von Karman Avenue and to Birch Street.

Michelson Drive is a four-lane divided east-west arterial in the City of Irvine, located approximately one-third mile south of the I-405 Freeway. Michelson Drive is divided by a painted median and has a posted speed limit of 45 miles per hour (mph) east of Von Karman Avenue and 40 mph west of Von Karman Avenue.

Dupont Drive is a four-lane undivided east-west arterial in the City of Irvine that extends from north of Michelson Drive to just east of Jamboree Road. Dupont Drive is divided by a painted median and has a posted speed limit of 35 mph to the west of Von Karman Avenue, and 40 mph to the east of Von Karman Avenue.

Campus Drive is a six-lane divided arterial that extends north-south between Bristol Street and MacArthur Boulevard, then turns and extends as a four-lane undivided arterial in an east-west orientation between MacArthur Boulevard and Carlson Avenue, then two-lane undivided between Carlson Avenue and University Drive. Class II bike lanes are provided on both sides of Campus Drive. The posted speed limit on Campus Drive ranges from 45 mph to 50 mph within the study area. Campus Drive is designated on the City of Newport Beach Circulation Element as a Major Arterial between Bristol Street and MacArthur Boulevard, and as a Secondary Arterial between MacArthur Boulevard and University Drive.

Birch Street is a four-lane undivided roadway, designated as a Secondary Arterial on the City of Newport Beach Circulation Element. Birch Street extends in a north-south direction from south of SR-73 to MacArthur Boulevard, and then turns and extends in an east-west direction from MacArthur Boulevard to Jamboree Road. Birch Street is divided by a painted median, and on-street parking is prohibited in the vicinity of the project. The posted speed limit is 45 miles per hour.

Fairchild Road is a four-lane collector in the City of Irvine that extends in a northwest-to-southeast arc from Jamboree Road to McArthur Boulevard. Fairchild Road is divided by a painted median and currently has no posted speed limit.

MacArthur Boulevard is a six- to eight-lane divided arterial that extends through the Cities of Newport Beach and Irvine. MacArthur Boulevard is divided by a raised or painted median and has a posted speed limit of 55 mph. MacArthur Boulevard is classified as a Major arterial in both cities' Circulation Elements.

Bristol Street North is part of the Bristol Street couplet that runs along either side of SR-73. Bristol Street North is a three- to four-lane one-way arterial that extends from Jamboree Road in a northwest direction north of and parallel to SR-73. It crosses over SR-73 and connects with Bristol Street at Santa Ana Avenue/Redhill Avenue. Bristol Street is classified as a Primary Arterial on the City of Newport Beach Circulation Element. The posted speed limit is 45 mph.

Bristol Street South is the southbound portion of the Bristol Street couplet. Bristol Street South is a four-lane one-way arterial that extends from Santa Ana Avenue/Redhill Avenue to Jamboree Road in a southeast direction south of and parallel to SR-73. The posted speed limit is 45 mph.

Von Karman Avenue is a four-lane north-south Primary Arterial that starts at MacArthur Boulevard in the City of Newport Beach, and extends northward into the City of Irvine. Von Karman Avenue is divided by a painted median and has a posted speed limit of 40 to 45 mph. Von Karman Avenue is classified as a Primary on the City of Newport Beach Circulation Element. On the City of Irvine Circulation Element, Von Karman Avenue is classified as a Secondary Highway between Campus Drive and Michelson Drive and as a Major Highway north of Michelson Drive.

Jamboree Road is a six- to eight-lane divided arterial that extends through both Irvine and Newport Beach in a north-south direction. Within the Newport Beach city limits, Jamboree Road is mainly a six-lane divided arterial with three lanes in each direction, with the exception of the segment between Birch Street and Fairchild Road, where there are four southbound travel lanes. Jamboree Road transitions into a seven-lane arterial north of the Newport Beach city limits. Jamboree Road is divided by a raised landscaped median and has a posted speed limit of 55 mph. Jamboree Road is classified as a Major arterial in both cities' Circulation Elements.

University Drive is a four-lane to six-lane divided arterial. University Drive extends eastward from Jamboree Road in the City of Newport Beach across the SR-73 into the City of Irvine, and

through the University of California Irvine (UCI). University Drive transitions from four to six lanes at the SR-73 southbound ramps. University Drive is divided by a raised landscaped median and has a posted speed limit of 50 mph within the City of Newport Beach limits. University Drive is classified as a Primary on the City of Newport Beach Circulation Element and a Major arterial on the City of Irvine Circulation Element.

Existing Transit Service

Transit service in the vicinity of the project site is provided by the Orange County Transportation Authority (OCTA) bus lines. The bus routes currently operated by OCTA through the study area in the cities of Newport Beach and Irvine are shown on **Figure 5**. The following OCTA routes serve the project site and vicinity.

OCTA Route 59 operates between the City of Anaheim and the City of Irvine via Kraemer Boulevard/Glassell Street/Grand Avenue and Von Karman Avenue. The Route 59 stop closest to the project site is at the corner of Campus Drive and Jamboree Road. Route 59 operates in full-route mode on weekdays from 4:30 AM to 11:30 PM with 20- to 35-minute headways (the time interval between bus arrivals). On Saturdays and Sundays, Route 59 does not offer service to UCI; it only operates to Pullman Street and Dyer Road from approximately 6:00 AM to 10:15 PM, with 50- to 60-minute headways.

OCTA Route 76 operates between the City of Huntington Beach and the City of Newport Beach via Talbert Avenue/MacArthur Boulevard. The Route 76 stop closest to the project site is at the corner of MacArthur Boulevard and Jamboree Road. Route 76 operates on weekdays only, from approximately 6:00 AM to 7:00 PM with 45-minute to 1-hour headways.

OCTA Route 178 operates between the City of Huntington Beach and the City of Irvine via Adams Avenue, Birch Street, and Campus Drive. The Route 178 stop closest the project site is located at the corner of Campus Drive and Jamboree Road. Route 178 operates on weekdays from 5:50 AM to 10:50 PM with 45-minute to 1-hour headways. Route 178 does not operate on weekends.

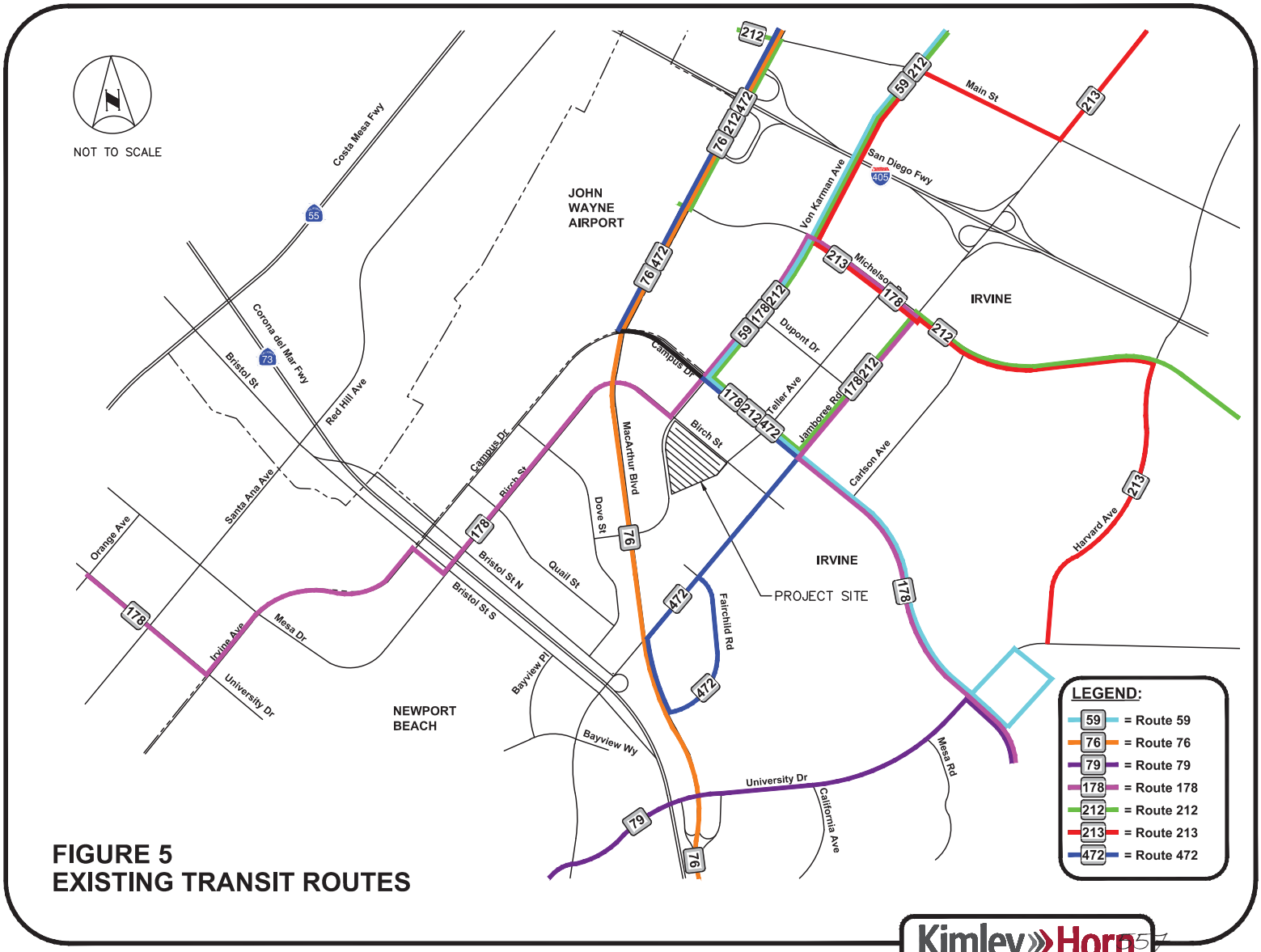

FIGURE 5
EXISTING TRANSIT ROUTES

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OCTA Route 212 provides express route service between John Wayne Airport and San Juan Capistrano via the San Diego Freeway (I-405). The Route 212 stop closest the project site is located at the corner of Campus Drive and Jamboree Road. Route 212 operates on weekdays only, and in the northbound direction only in the morning – from 5:50 to 7:30 AM; and in the southbound direction only in the evening – from 4:00 to 6:30 PM.

OCTA Route 213 operates between the Park-and-Ride in Brea and UCI. Major destinations along the route include Brea Mall, Fullerton Transportation Center, the Village at Orange, and UCI. Route 213 operates on weekdays only, and in the southbound direction only in the morning – from 5:22 to 7:58 AM; and in the northbound direction only in the evening – from 4:03 to 6:58 PM.

OCTA Route 472 provides Metrolink feeder route service for the Tustin Metrolink Station on Jamboree Road. Route 472 starts at the Tustin Metrolink Station and travels through the City of Irvine where it turns around at the Food and Drug Administration building on Fairchild Road, across Jamboree Road from the project site. The Route 472 stop closest to the site is located at the corner of Fairchild Road and Jamboree Road. Route 472 operates on weekdays only, and in the southbound direction only in the morning – from 6:10 to 9:00 AM; and in the northbound direction only in the evening – from 3:30 to 5:20 PM.

EXISTING TRAFFIC CONDITIONS

Existing Traffic Volumes

Field observations of all study intersections were conducted to document the number of through and turning lanes, traffic control, and other existing traffic conditions at each intersection. Existing lane configurations and intersection traffic control at the study intersections are shown on **Figure 6**.

Existing morning and evening peak hour intersection turning movement counts were provided by the City of Newport Beach and the City of Irvine. Intersection counts that were not provided by either City were collected in 2016.

The traffic counts provided by the cities of Newport Beach and Irvine were conducted between 2014 and 2015. For City of Newport Beach intersections, traffic counts older than one year have been grown at 1% per year on certain major roadways, per direction from City staff. For City of Irvine intersections, traffic counts were grown at 2% per year, based on direction from City staff. The resulting peak hour turning movement volumes are shown on **Figure 7**. Copies of peak hour traffic data collection sheets are provided in ***Appendix A*.**

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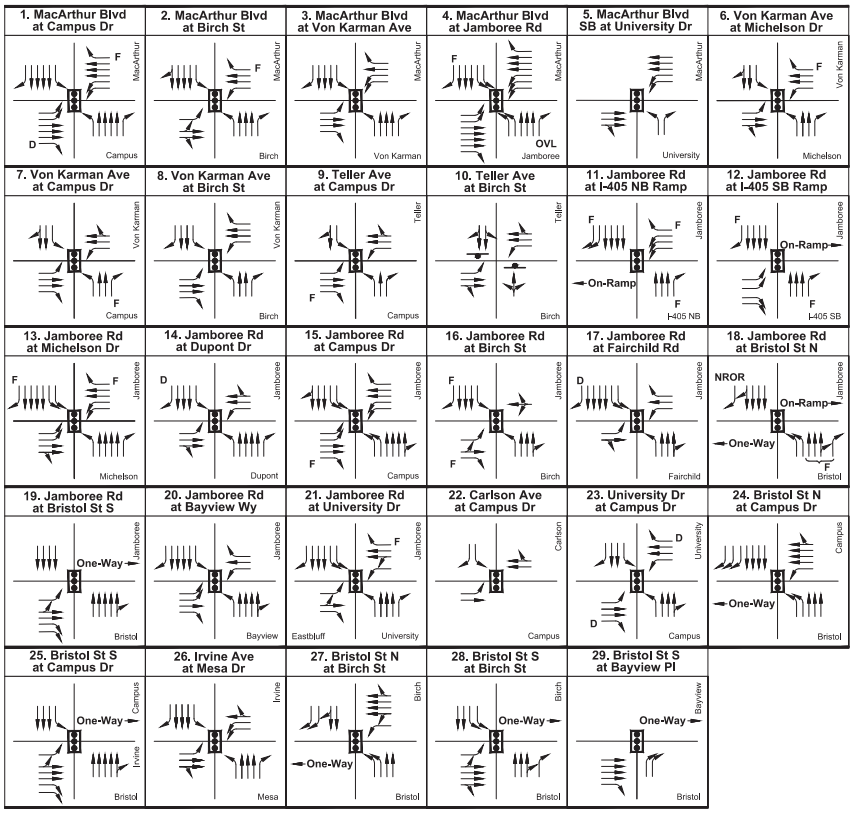
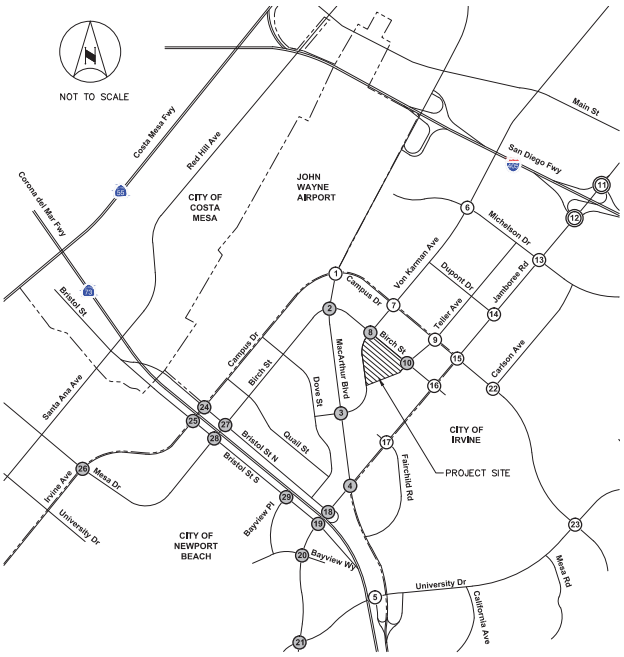
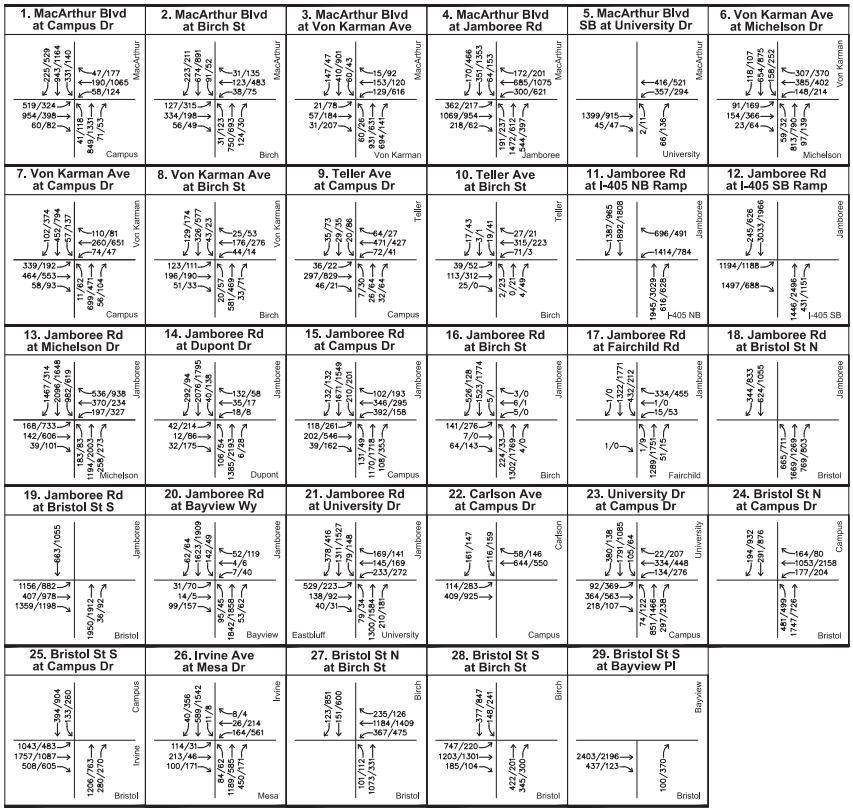


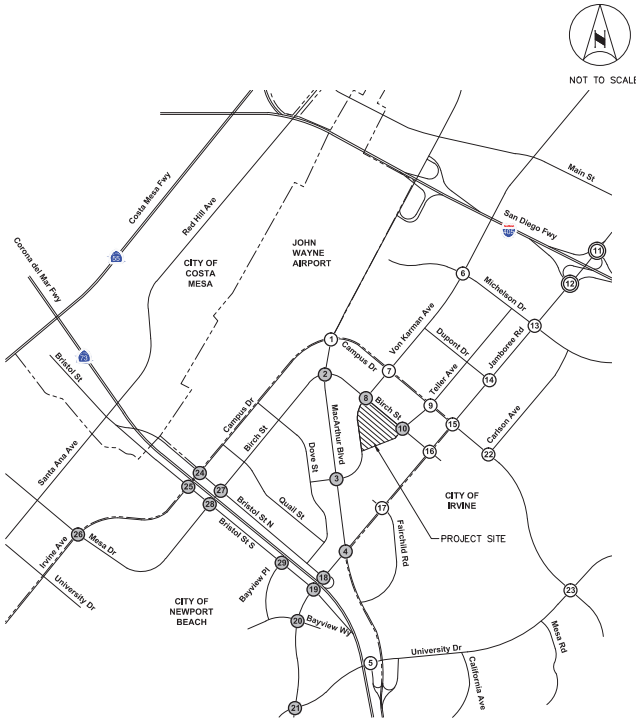


LEGEND:

- Newport Beach Intersection
- Irvine Intersection
- Caltrans Intersection
- City Boundary
- F — Free Movement
- OVL — Right-Turn Overlap
- D — Defacto Right-Turn Lane
- NROR — No Right-Turn On Red
- Signal
- Stop Sign

FIGURE 6
EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL





LEGEND:

- Newport Beach Intersection
- Irvine Intersection
- Caltrans Intersection
- City Boundary
- XX/YY AM/PM Peak Hour Turning Movement Volumes

FIGURE 7
EXISTING PEAK HOUR TRAFFIC VOLUMES

Existing Intersection Analysis

Peak hour intersection analysis was conducted for the signalized study intersections using the applicable intersection analysis methodology and parameters for each city, as discussed previously in this report. Unsignalized intersections were analyzed using the HCM methodology for unsignalized intersections.

Existing AM and PM peak hour intersection operations are summarized on **Table 1**. Review of this table indicates that all study intersections are currently operating at an acceptable Level of Service (LOS D for all intersections, except LOS E for intersections in the Airport Area or the IBC area, and CMP intersections) in both peak hours.

Intersection Level of Service worksheets are provided in ***Appendix B***.

PROJECT TRAFFIC

Trip Generation

Trip generation estimates for the proposed project were developed using the Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition) publication. The proposed project components and trip generation estimates for the Koll Center Residences are as follows:

- Luxury Condominiums/Townhouse (Land Use 233)
- Specialty Retail Center (Land Use 826)

The trip generation estimates for the proposed project were developed by adding together the trips generated by the residential and retail uses. However, not all trips from the retail land use are anticipated to be off-site trips. Some trips are expected to be captured by the internal land uses, such as the existing office uses, and the proposed residential uses. A 10% retail adjustment factor was applied to the Specialty Retail land use to account for internal capture, as directed by City of Newport Beach staff.

Daily, morning peak hour, and evening peak hour trip generation estimates for the Koll Center Residences project are shown on **Table 2**. The project would generate approximately 1,207 daily trips, with 149 morning peak hour trips (36 inbound and 113 outbound) and 151 evening peak hour trips (94 inbound and 57 outbound).

Trip Distribution and Assignment

Trip distribution assumptions for the project site were developed based on likely origins and destinations of project residents and visitors, and the transportation network available for those trips. Distribution assumptions were submitted to City staff for review and concurrence. Trip distribution assumptions for the project are shown on **Figure 8**. The resulting project-related traffic volumes at each study intersection are shown on **Figure 9**.

TABLE 1
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
EXISTING CONDITIONS

		Int. Control	AM Peak Hour		PM Peak Hour	
			ICU/ Delay	LOS	ICU/ Delay	LOS
1	MacArthur Blvd at Campus Dr *	S	0.57	A	0.74	C
2	MacArthur Blvd at Birch St	S	0.38	A	0.52	A
3	MacArthur Blvd at Von Karman Ave	S	0.58	A	0.53	A
4	MacArthur Blvd at Jamboree Rd *	S	0.58	A	0.65	B
5	MacArthur Blvd SB at University Dr	S	0.48	A	0.41	A
6	Von Karman Ave at Michelson Dr *	S	0.55	A	0.68	B
7	Von Karman Ave at Campus Dr *	S	0.60	A	0.76	C
8	Von Karman Ave at Birch St	S	0.34	A	0.37	A
9	Teller Ave at Campus Dr *	S	0.27	A	0.41	A
10	Teller Ave at Birch St	U	13.1	B	13.0	B
11	Jamboree Rd at I-405 NB Ramps *	S	0.71	C	0.80	C
12	Jamboree Rd at I-405 SB Ramps *	S	0.93	E	0.89	D
13	Jamboree Rd at Michelson Dr *	S	0.67	B	0.83	D
14	Jamboree Rd at Dupont Dr *	S	0.62	B	0.61	B
15	Jamboree Rd at Campus Dr *	S	0.62	B	0.62	B
16	Jamboree Rd at Birch St *	S	0.53	A	0.50	A
17	Jamboree Rd at Fairchild Rd *	S	0.64	B	0.73	C
18	Jamboree Rd at Bristol St N	S	0.33	A	0.48	A
19	Jamboree Rd at Bristol St S	S	0.67	B	0.64	B
20	Jamboree Rd at Bayview Wy	S	0.45	A	0.45	A
21	Jamboree Rd at University Dr	S	0.61	B	0.57	A
22	Carlson Ave at Campus Dr *	S	0.42	A	0.69	B
23	University Dr at Campus Dr[1]	S	0.74	C	0.70	B
24	Bristol St N at Campus Dr	S	0.55	A	0.70	B
25	Bristol St S at Campus Dr / Irvine Ave	S	0.71	C	0.58	A
26	Irvine Ave at Mesa Dr	S	0.44	A	0.64	B
27	Bristol St N at Birch St	S	0.63	B	0.58	A
28	Bristol St S at Birch St	S	0.47	A	0.56	A
29	Bristol St S at Bayview Pl	S	0.41	A	0.46	A

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

* Level of Service E is acceptable at this intersection.

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

TABLE 2
SUMMARY OF PROJECT TRIP GENERATION

Land Use	ITE Code	Unit	Trip Generation Rates [1]						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Luxury Condominium/Townhouse [2]	233	DU	4.18	0.129	0.431	0.56	0.347	0.204	0.55
Specialty Retail Center [3]	826	KSF	44.32	0.595	0.365	0.96	1.192	1.518	2.71

Land Use	Quantity	Unit	Trip Generation Estimates						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Luxury Condominium/Townhouse	260	DU	1,087	34	112	146	90	53	143
Specialty Retail Center	3.000	KSF	133	2	1	3	4	5	9
Retail Adjustment Factor (10%) [4]			-13	0	0	0	0	-1	-1
Total Project Trips			**1,207**	**36**	**113**	**149**	**94**	**57**	**151**

[1] Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition

[2] ITE Trip Generation does not provide daily rates for a Luxury Condominium/Townhouse. Therefore, the daily rates for Land Use Category 232 - High-Rise Residential Condominium/Townhouse were used to estimate daily trips.

[3] ITE Trip Generation does not provide AM peak hour rates for a Specialty Retail Center. Therefore, the AM peak hour rates for Land Use Category 820 - Shopping Center were used to estimate AM peak hour trips.

[4] A 10% adjustment factor to account for internal capture between the existing offices and the proposed residential and retail uses is assumed.

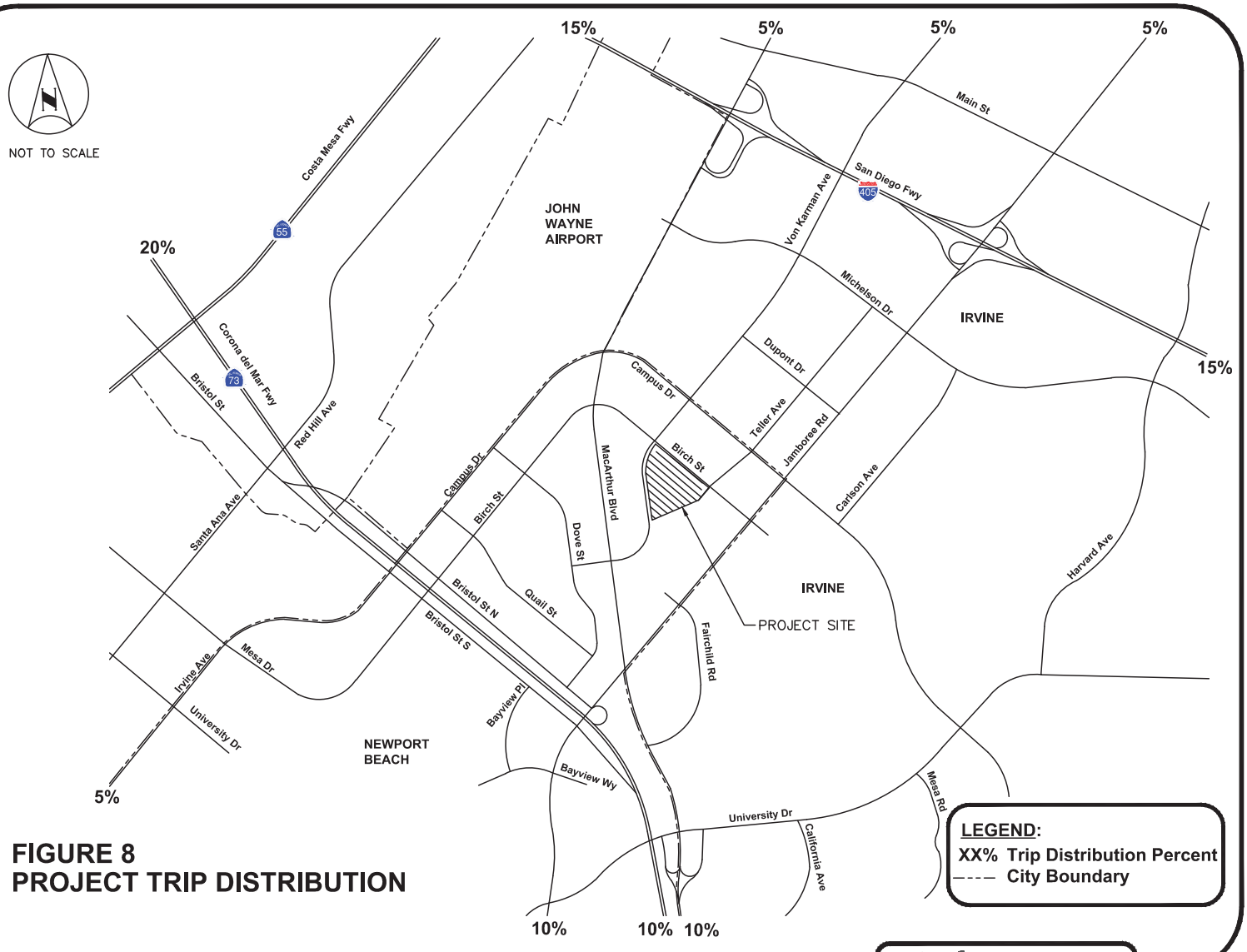
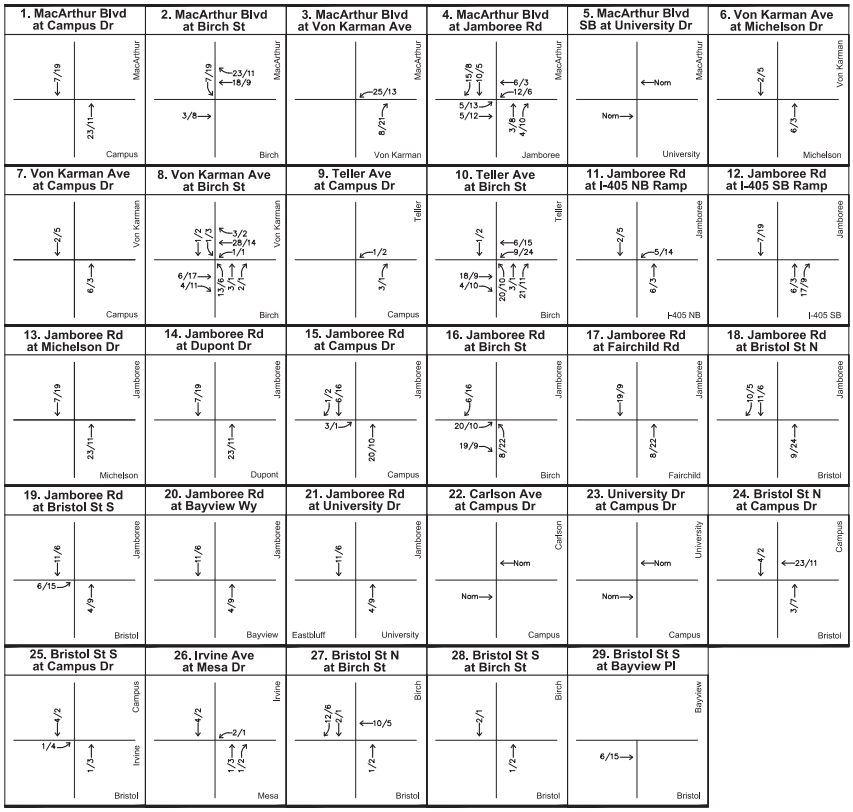


FIGURE 8
PROJECT TRIP DISTRIBUTION



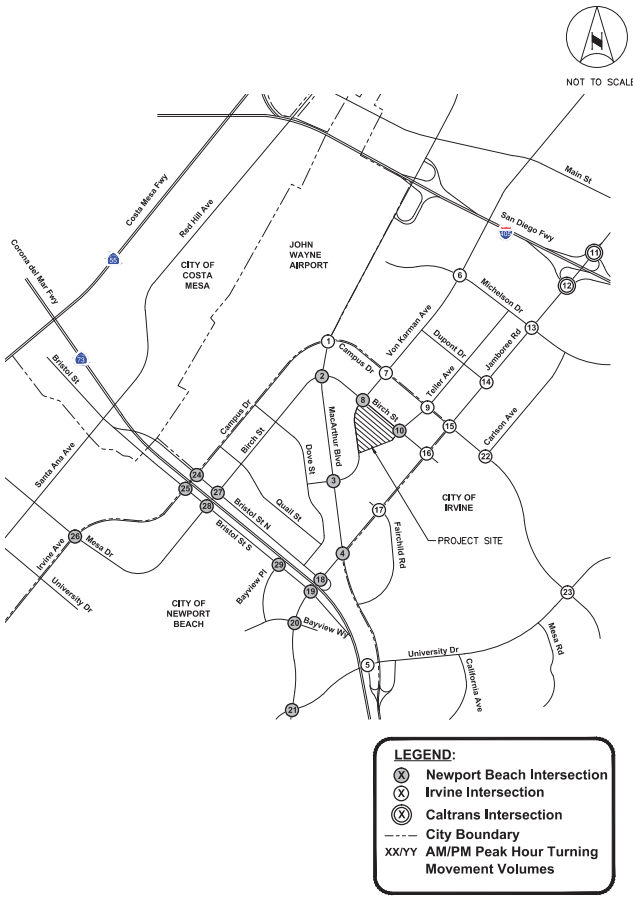


FIGURE 9
PROJECT-RELATED PEAK HOUR TRAFFIC VOLUMES

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EXISTING PLUS PROJECT CONDITIONS

This section presents the results of the analysis of the impacts associated with adding project-related trips to existing traffic volumes. The Existing Plus Project scenario is a hypothetical scenario which assumes that the Project would be fully implemented at the present time. This analysis is required by the California Environmental Quality Act (CEQA), and assumes full development of the Project and full absorption of Project traffic on the existing circulation system.

Existing Plus Project peak hour volumes are shown on **Figure 10**. The intersection analysis was conducted, and the results are summarized on **Table 3**. With the addition of project traffic to Existing Conditions peak hour traffic volumes, all study intersections would continue to operate at an acceptable Level of Service. The addition of project traffic would not cause a significant impact at any study intersection.

FUTURE CONDITIONS

Year 2022 was used in the analysis of Future Conditions. Near-term future traffic forecasts have been developed for two analysis conditions:

- Opening Year with Existing plus Growth plus Committed Projects, representing analysis of the conditions required by the City of Newport Beach Traffic Phasing Ordinance (TPO)

- Opening Year with Existing plus Growth plus Committed plus Cumulative Projects, as required by CEQA. A discussion of each is provided in the following sections.

Traffic Phasing Ordinance (TPO) Analysis

The City of Newport Beach TPO first requires a determination of whether project trips will increase traffic volumes on any leg of a Primary Intersection by one percent (1%) or more during either the morning or evening peak hour one year after project completion, or that portion of the project expected to be constructed within five years (sixty months) of project approval, which would be Year 2022. The TPO then requires a Level of Service analysis of the project impact at any Primary Intersection that exceeds the 1% threshold.

For TPO purposes, traffic forecasts for study intersections in the City of Newport Beach are developed by applying an ambient growth rate of one percent per year on primary roadways (Jamboree Road, MacArthur Boulevard and Irvine Avenue), plus traffic from Committed Projects in the vicinity of the project site. For study intersections in the City of Irvine, a growth factor of 2% per year is applied to develop Year 2022 forecasts.

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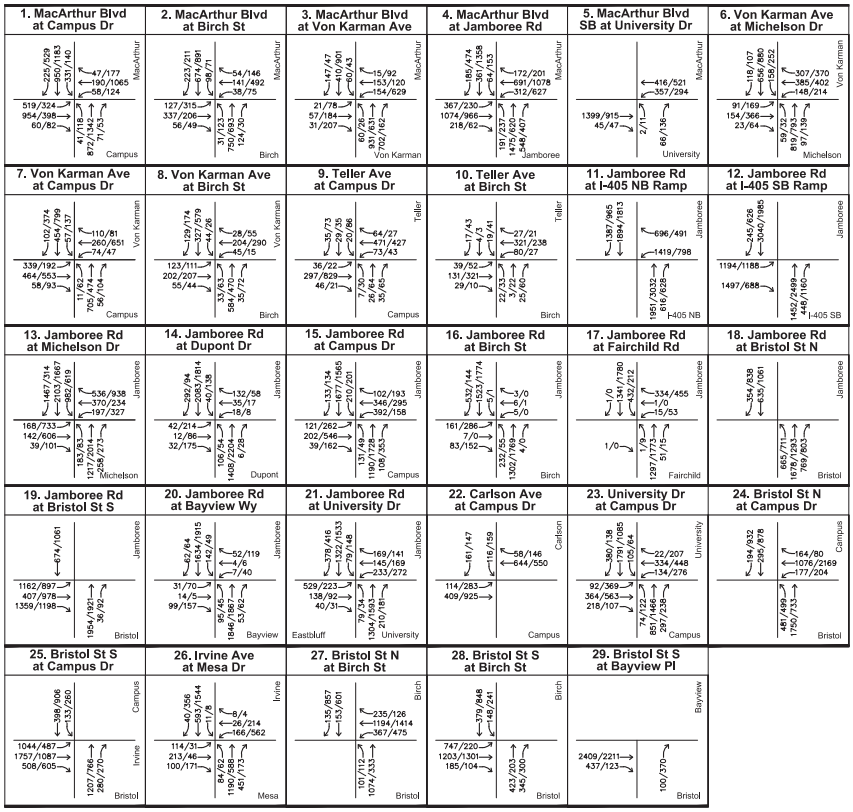


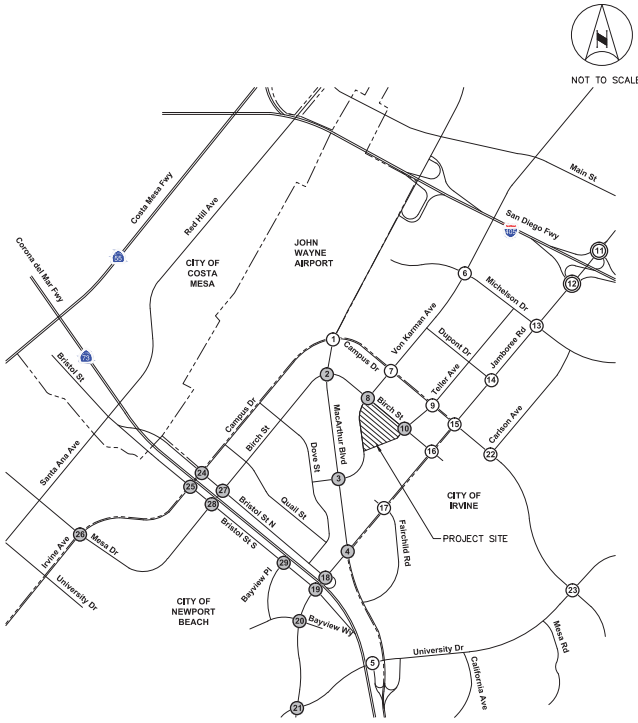


FIGURE 10
EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES

TABLE 3
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
EXISTING PLUS PROJECT CONDITIONS

	Intersection	Int. Control	Without Project				With Project				Project Impact			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		Change		Significant ?	
			ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	AM	PM	AM	PM
1	MacArthur Blvd at Campus Dr *	S	0.574	A	0.735	C	0.577	A	0.735	C	0.003	0.000	No	No
2	MacArthur Blvd at Birch St	S	0.376	A	0.517	A	0.387	A	0.522	A	0.011	0.005	No	No
3	MacArthur Blvd at Von Karman Ave	S	0.580	A	0.526	A	0.585	A	0.530	A	0.005	0.004	No	No
4	MacArthur Blvd at Jamboree Rd *	S	0.583	A	0.648	B	0.586	A	0.653	B	0.003	0.005	No	No
5	MacArthur Blvd SB at University Dr	S	0.477	A	0.405	A	0.477	A	0.405	A	0.000	0.000	No	No
6	Von Karman Ave at Michelson Dr *	S	0.549	A	0.683	B	0.551	A	0.684	B	0.002	0.001	No	No
7	Von Karman Ave at Campus Dr *	S	0.597	A	0.758	C	0.599	A	0.760	C	0.002	0.002	No	No
8	Von Karman Ave at Birch St	S	0.340	A	0.372	A	0.351	A	0.380	A	0.011	0.008	No	No
9	Teller Ave at Campus Dr *	S	0.270	A	0.406	A	0.270	A	0.407	A	0.000	0.001	No	No
10	Teller Ave at Birch St	U	13.1	B	13.0	B	13.9	B	14.5	B	0.8	1.5	No	No
11	Jamboree Rd at I-405 NB Ramps *	S	0.709	C	0.798	C	0.711	C	0.801	C	0.002	0.003	No	No
12	Jamboree Rd at I-405 SB Ramps *	S	0.928	E	0.889	D	0.929	E	0.889	D	0.001	0.000	No	No
13	Jamboree Rd at Michelson Dr *	S	0.673	B	0.831	D	0.676	B	0.832	D	0.003	0.001	No	No
14	Jamboree Rd at Dupont Dr *	S	0.622	B	0.614	B	0.623	B	0.615	B	0.001	0.001	No	No
15	Jamboree Rd at Campus Dr *	S	0.617	B	0.621	B	0.618	B	0.622	B	0.001	0.001	No	No
16	Jamboree Rd at Birch St *	S	0.532	A	0.499	A	0.543	A	0.515	A	0.011	0.016	No	No
17	Jamboree Rd at Fairchild Rd *	S	0.636	B	0.726	C	0.638	B	0.731	C	0.002	0.005	No	No
18	Jamboree Rd at Bristol St N	S	0.329	A	0.483	A	0.331	A	0.484	A	0.002	0.001	No	No
19	Jamboree Rd at Bristol St S	S	0.673	B	0.638	B	0.673	B	0.642	B	0.000	0.004	No	No
20	Jamboree Rd at Bayview Wy	S	0.451	A	0.450	A	0.452	A	0.450	A	0.001	0.000	No	No
21	Jamboree Rd at University Dr	S	0.610	B	0.567	A	0.612	B	0.568	A	0.002	0.001	No	No
22	Carlson Ave at Campus Dr *	S	0.418	A	0.688	B	0.418	A	0.688	B	0.000	0.000	No	No
23	University Dr at Campus Dr[1]	S	0.740	C	0.704	B	0.740	C	0.704	B	0.000	0.000	No	No
24	Bristol St N at Campus Dr	S	0.554	A	0.700	B	0.558	A	0.702	B	0.004	0.002	No	No
25	Bristol St S at Campus Dr / Irvine Ave	S	0.706	C	0.577	A	0.707	C	0.577	A	0.001	0.000	No	No
26	Irvine Ave at Mesa Dr	S	0.437	A	0.642	B	0.438	A	0.643	B	0.001	0.001	No	No
27	Bristol St N at Birch St	S	0.631	B	0.582	A	0.633	B	0.584	A	0.002	0.002	No	No
28	Bristol St S at Birch St	S	0.471	A	0.557	A	0.471	A	0.558	A	0.000	0.001	No	No
29	Bristol St S at Bayview Pl	S	0.407	A	0.459	A	0.408	A	0.461	A	0.001	0.002	No	No

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

* Level of Service E is acceptable at this intersection.

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

Committed projects consist of projects in the City of Newport Beach that have been approved, but are not yet fully constructed and occupied. Committed Projects information was provided by the City of Newport Beach Staff. A copy of the Committed Projects data sheets provided by the City of Newport Beach is included in ***Appendix C***. A summary of the Newport Beach Committed Projects is provided on **Table 4**.

TABLE 4
SUMMARY OF CITY OF NEWPORT BEACH COMMITTED PROJECTS

Project Number	Project Name	Percent Complete
148	Fashion Island Expansion	40%
154	Temple Bat Yahm Expansion	65%
910	Newport Dunes	0%
945	Hoag Hospital Phase III	0%
949	St. Mark Presbyterian Church	77%
955	2300 Newport Boulevard	0%
958	Hoag Health Center	95%
959	North Newport Center	0%
960	Santa Barbara Condominiums	33%
962	328 Old Newport Medical	0%
965	Mariner's Pointe	16%
966	4221 Dolphin Striker	55%
967	San Joaquin Hills Plaza	0%
968	Uptown Newport (Phase 2)	0%
969	Uptown Newport (Phase 1)	0%
970	Marina Park	0%
971	Back Bay Landing 300 E. Coast Highway	0%
972	Westcliff Drive Medical Plaza	0%
973	Lido House Hotel Traffic	0%
974	Newport Executive Center	0%
975	Ebb Tide Residential	0%
976	ENC Nature Pre-school	0%
977	Balboa Marina West	0%

Source: City of Newport Beach – Traffic Phasing Ordinance Data – Includes approved projects less than 100% complete.

Traffic volumes generated by the Committed Projects in the study area were added to existing peak hour volumes plus ambient growth to develop the TPO Analysis Year 2022 forecast traffic volumes. The resulting peak hour traffic volumes are shown on **Figure 11**.

TPO 1% Analysis

In accordance with City of Newport Beach traffic study requirements, the project traffic contribution at the study intersections was evaluated for the TPO Analysis to determine the extent of the Traffic Impact Study required of the project. The study intersections identified through the 1% Analysis will be evaluated for the TPO Analysis, as required by the City of Newport Beach traffic study requirements.

For the TPO Analysis, the project-related morning and evening peak hour traffic volumes were compared to the TPO Analysis Year 2022 Without Project peak hour volumes on each leg of each study intersection to determine whether or not the project would result in a 1% increase. The results of the analysis are summarized on **Table 5**. The 1% Analysis Worksheets for the TPO Analysis are provided in ***Appendix D***. Review of Table 5 shows that the project traffic will exceed 1% on at least one approach in one or both peak hours at each of the Newport Beach study intersections, except at the following intersections:

- 7. Von Karman Avenue at Campus Drive
- 20. Jamboree Road at Bayview Way
- 21. Jamboree Road at University Drive
- 25. Bristol Street S at Campus Drive
- 28. Bristol Street S at Birch Street
- 29. Bristol Street S at Bayview Place

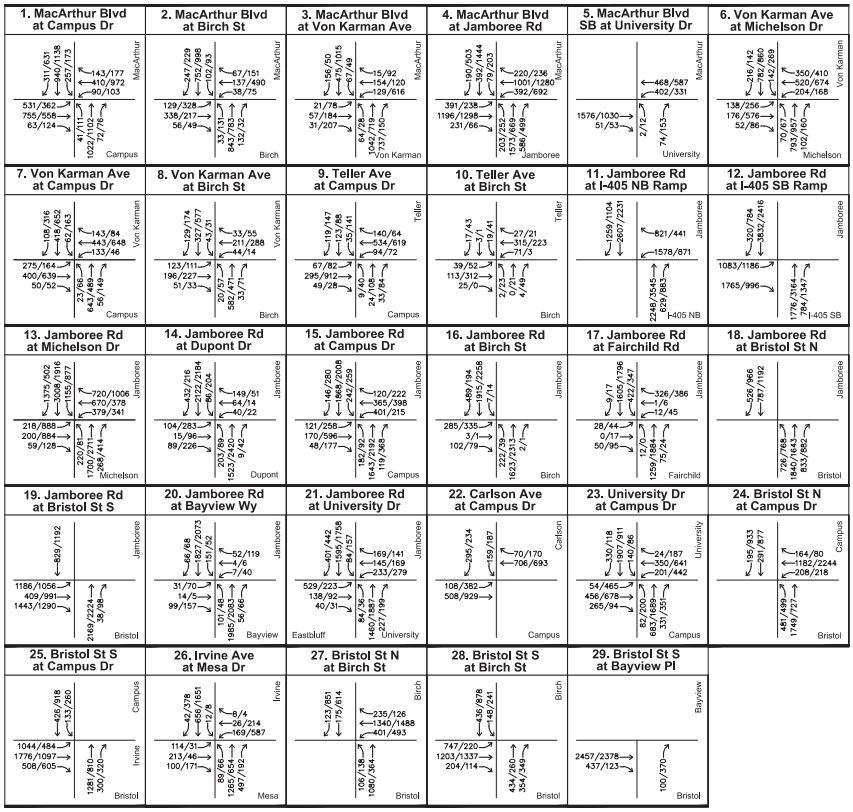
The analysis will proceed with a TPO Traffic Impact Study at the remaining Newport Beach study intersections. It should be noted that the 1% Analysis was not conducted for the study intersections in the City of Irvine, since the TPO requirement only applies to the City of Newport Beach intersections. All of the study intersections in the City of Irvine have been analyzed for all study scenarios in this report.

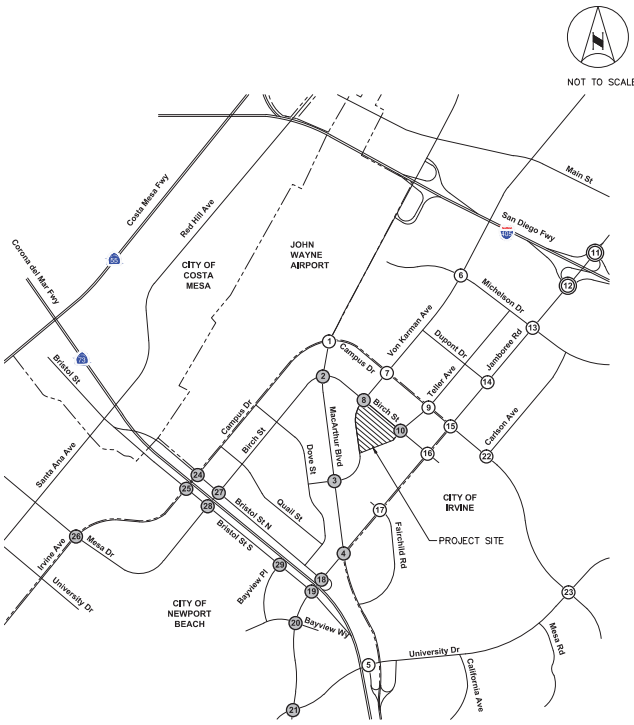
TPO Analysis Year 2022 Without Project

Intersection analysis was conducted for the TPO Analysis Year 2022 (Existing plus Growth plus Committed Projects) Without Project peak hour traffic conditions. Intersection worksheets are provided in ***Appendix B***. The results of the intersection analysis are summarized on **Table 6**. The following intersections would operate at an unacceptable Level of Service under TPO Analysis Year 2022 Without Project Conditions:

- 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
- 13. Jamboree Road at Michelson Drive (PM: LOS F)

All other study intersections would operate at an acceptable Level of Service in both peak hours.





LEGEND:

- Newport Beach Intersection
- Irvine Intersection
- Caltrans Intersection
- City Boundary
- XX/YY AM/PM Peak Hour Turning Movement Volumes

FIGURE 11
TPO ANALYSIS YEAR 2022 WITHOUT PROJECT PEAK HOUR TRAFFIC VOLUMES

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TABLE 5
SUMMARY OF 1% ANALYSIS
TPO ANALYSIS

No.	Intersection	Condition	Northbound Approach		Southbound Approach		Eastbound Approach		Westbound Approach	
			AM	PM	AM	PM	AM	PM	AM	PM
1	MacArthur Blvd/Campus Dr	1% of projected pk hr volume	11	17	16	21	15	9	3	15
		Project peak hour volume	23	11	7	19	0	0	0	0
		Project traffic less than 1%?	N	Y	Y	Y	Y	Y	Y	Y
2	MacArthur Blvd/Birch St	1% of projected pk hr volume	10	9	11	13	5	7	2	8
		Project peak hour volume	0	0	7	19	3	8	41	20
		Project traffic less than 1%?	Y	Y	Y	N	Y	N	N	N
3	MacArthur Blvd/Von Karman Ave	1% of projected pk hr volume	18	9	7	11	1	5	3	9
		Project peak hour volume	8	21	0	0	0	0	25	13
		Project traffic less than 1%?	Y	N	Y	Y	Y	Y	N	N
4	MacArthur Blvd/Jamboree Rd	1% of projected pk hr volume	24	14	7	21	18	14	16	21
		Project peak hour volume	7	18	25	13	10	25	18	9
		Project traffic less than 1%?	Y	N	N	Y	Y	N	N	Y
7	Von Karman Ave/Campus Dr	1% of projected pk hr volume	8	6	6	13	9	9	5	8
		Project peak hour volume	6	3	2	5	0	0	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y
15	Jamboree Rd/Campus Dr	1% of projected pk hr volume	17	24	22	22	4	12	8	9
		Project peak hour volume	20	10	7	18	3	1	0	0
		Project traffic less than 1%?	N	Y	Y	Y	Y	Y	Y	Y
16	Jamboree Rd/Birch St	1% of projected pk hr volume	18	20	22	23	3	7	0	3
		Project peak hour volume	8	22	6	16	39	19	0	0
		Project traffic less than 1%?	Y	N	Y	Y	N	N	Y	Y
18	Jamboree Rd/Bristol St N	1% of projected pk hr volume	34	33	13	22	0	2	0	2
		Project peak hour volume	9	24	21	11	0	0	0	0
		Project traffic less than 1%?	Y	Y	N	Y	Y	Y	Y	Y
19	Jamboree Rd/Bristol St S	1% of projected pk hr volume	22	23	8	12	30	31	0	1
		Project peak hour volume	4	9	11	6	6	15	0	0
		Project traffic less than 1%?	Y	Y	N	Y	Y	Y	Y	Y
20	Jamboree Rd/Bayview Wy	1% of projected pk hr volume	21	22	20	22	1	3	1	2
		Project peak hour volume	4	9	11	6	0	0	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y
21	Jamboree Rd/University Dr	1% of projected pk hr volume	18	21	21	24	7	5	5	7
		Project peak hour volume	4	9	11	6	0	0	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y
24	Bristol St N/Campus Dr	1% of projected pk hr volume	22	12	5	18	0	0	16	24
		Project peak hour volume	3	7	4	2	0	0	23	11
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	N	Y
25	Bristol St S/Campus Dr	1% of projected pk hr volume	15	11	6	12	33	22	0	0
		Project peak hour volume	1	3	4	2	1	4	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y
26	Irvine Ave/Mesa Dr	1% of projected pk hr volume	18	9	7	20	4	3	2	8
		Project peak hour volume	2	5	4	2	0	0	2	1
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	N	Y
27	Bristol St N/Birch St	1% of projected pk hr volume	12	5	3	15	0	0	20	20
		Project peak hour volume	1	2	14	7	0	0	10	5
		Project traffic less than 1%?	Y	Y	N	Y	Y	Y	Y	Y
28	Bristol St S/Birch St	1% of projected pk hr volume	8	6	6	11	22	17	0	0
		Project peak hour volume	1	2	2	1	0	0	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y
29	Bristol St S/Bayview Pl	1% of projected pk hr volume	1	4	0	0	29	23	0	0
		Project peak hour volume	0	0	0	0	6	15	0	0
		Project traffic less than 1%?	Y	Y	Y	Y	Y	Y	Y	Y

TABLE 6
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
TPO ANALYSIS YEAR 2022 WITHOUT PROJECT

	Intersection	Int. Control	Without Project			
			AM Peak Hour		PM Peak Hour	
			ICU/ Delay	LOS	ICU/ Delay	LOS
1	MacArthur Blvd at Campus Dr *	S	0.59	A	0.78	C
2	MacArthur Blvd at Birch St	S	0.41	A	0.55	A
3	MacArthur Blvd at Von Karman Ave	S	0.61	B	0.55	A
4	MacArthur Blvd at Jamboree Rd *	S	0.68	B	0.73	C
5	MacArthur Blvd SB at University Dr	S	0.53	A	0.45	A
6	Von Karman Ave at Michelson Dr *	S	0.62	B	0.84	D
7	Von Karman Ave at Campus Dr *	S	0.61	B	0.69	B
8	Von Karman Ave at Birch St	S	0.35	A	0.38	A
9	Teller Ave at Campus Dr *	S	0.44	A	0.52	A
10	Teller Ave at Birch St	U	13.1	B	13.0	B
11	Jamboree Rd at I-405 NB Ramps *	S	0.80	C	0.92	E
12	Jamboree Rd at I-405 SB Ramps *	S	1.13	**F**	1.02	**F**
13	Jamboree Rd at Michelson Dr *	S	0.90	D	1.08	**F**
14	Jamboree Rd at Dupont Dr *	S	0.70	B	0.73	C
15	Jamboree Rd at Campus Dr *	S	0.67	B	0.76	C
16	Jamboree Rd at Birch St *	S	0.64	B	0.62	B
17	Jamboree Rd at Fairchild Rd *	S	0.64	B	0.78	C
18	Jamboree Rd at Bristol St N	S	0.39	A	0.54	A
19	Jamboree Rd at Bristol St S	S	0.73	C	0.72	C
22	Carlson Ave at Campus Dr *	S	0.52	A	0.73	C
23	University Dr at Campus Dr[1]	S	0.84	D	0.87	D
24	Bristol St N at Campus Dr	S	0.58	A	0.71	C
26	Irvine Ave at Mesa Dr	S	0.47	A	0.68	B
27	Bristol St N at Birch St	S	0.67	B	0.61	B

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

* Level of Service E is acceptable at this intersection.

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and in average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

TPO Analysis Year 2022 With Project

In this scenario, project-related peak hour traffic volumes are added to the TPO Analysis Year 2022 Without Project traffic volumes. TPO Analysis Year 2022 With Project peak hour volumes are shown on **Figure 12**. The results of the intersection analysis are summarized on **Table 7**. The following study intersections would continue to operate at an unacceptable Level of Service with the addition of project traffic:

- 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
- 13. Jamboree Road at Michelson Drive (PM: LOS F)

The project impact increment does not exceed the significance threshold at these intersections; therefore, the addition of project trips would not result in a significant impact. All other study intersections would operate at an acceptable Level of Service in both peak hours.

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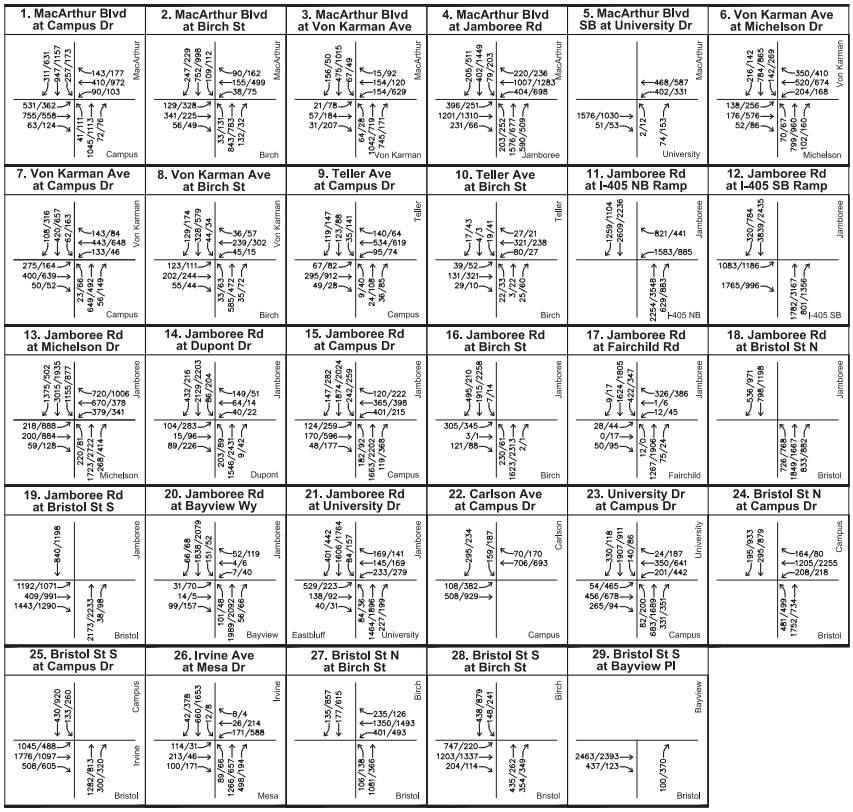

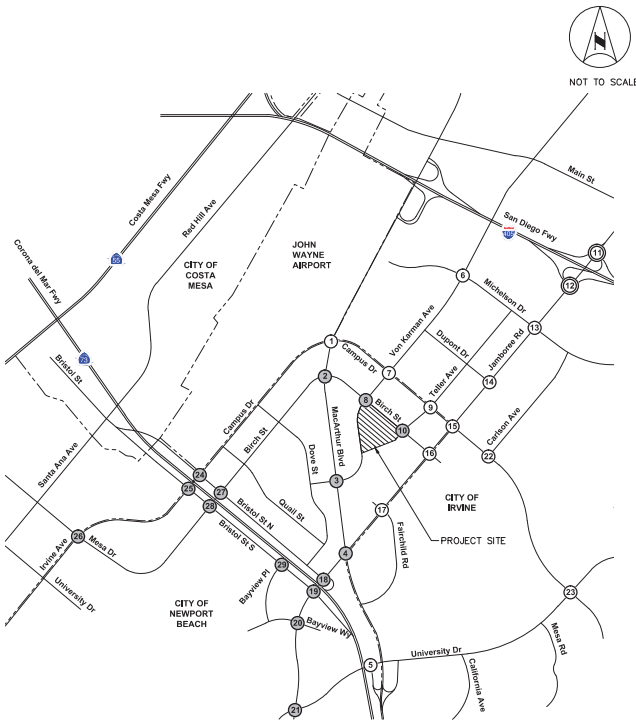

LEGEND:

- (X) Newport Beach Intersection
- (X) Irvine Intersection
- (X) Caltrans Intersection
- ---- City Boundary
- XX/YY AM/PM Peak Hour Turning Movement Volumes

FIGURE 12
TPO ANALYSIS YEAR 2022 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

TABLE 7
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
TPO ANALYSIS YEAR 2022 WITH PROJECT

	Intersection	Int. Control	Without Project				With Project				Project Impact			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		Change		Significant ?	
			ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	AM	PM	AM	PM
1	MacArthur Blvd at Campus Dr *	S	0.59	A	0.78	C	0.59	A	0.78	C	0.003	0.000	No	No
2	MacArthur Blvd at Birch St	S	0.41	A	0.55	A	0.42	A	0.56	A	0.011	0.004	No	No
3	MacArthur Blvd at Von Karman Ave	S	0.61	B	0.55	A	0.62	B	0.56	A	0.005	0.004	No	No
4	MacArthur Blvd at Jamboree Rd *	S	0.68	B	0.73	C	0.69	B	0.73	C	0.004	0.000	No	No
5	MacArthur Blvd SB at University Dr	S	0.53	A	0.45	A	0.53	A	0.45	A	0.000	0.000	No	No
6	Von Karman Ave at Michelson Dr *	S	0.62	B	0.84	D	0.62	B	0.84	D	0.000	0.001	No	No
7	Von Karman Ave at Campus Dr *	S	0.61	B	0.69	B	0.61	B	0.69	B	0.001	0.002	No	No
8	Von Karman Ave at Birch St	S	0.35	A	0.38	A	0.36	A	0.38	A	0.010	0.009	No	No
9	Teller Ave at Campus Dr *	S	0.44	A	0.52	A	0.44	A	0.52	A	0.000	0.001	No	No
10	Teller Ave at Birch St	U	13.1	B	13.0	B	13.9	B	14.5	B	0.8	1.5	No	No
11	Jamboree Rd at I-405 NB Ramps *	S	0.80	C	0.92	E	0.80	C	0.92	E	0.002	0.003	No	No
12	Jamboree Rd at I-405 SB Ramps *	S	1.13	**F**	1.02	**F**	1.13	**F**	1.02	**F**	0.001	0.001	No	No
13	Jamboree Rd at Michelson Dr *	S	0.90	D	1.08	**F**	0.90	D	1.08	**F**	0.003	0.001	No	No
14	Jamboree Rd at Dupont Dr *	S	0.70	B	0.73	C	0.71	C	0.73	C	0.001	0.001	No	No
15	Jamboree Rd at Campus Dr *	S	0.67	B	0.76	C	0.67	B	0.77	C	0.001	0.004	No	No
16	Jamboree Rd at Birch St *	S	0.64	B	0.62	B	0.65	B	0.63	B	0.010	0.016	No	No
17	Jamboree Rd at Fairchild Rd *	S	0.64	B	0.78	C	0.65	B	0.78	C	0.002	0.005	No	No
18	Jamboree Rd at Bristol St N	S	0.39	A	0.54	A	0.39	A	0.54	A	0.002	0.001	No	No
19	Jamboree Rd at Bristol St S	S	0.73	C	0.72	C	0.73	C	0.72	C	0.000	0.004	No	No
22	Carlson Ave at Campus Dr *	S	0.52	A	0.73	C	0.52	A	0.73	C	0.000	0.000	No	No
23	University Dr at Campus Dr[1]	S	0.84	D	0.87	D	0.84	D	0.87	D	0.000	0.000	No	No
24	Bristol St N at Campus Dr	S	0.58	A	0.71	C	0.58	A	0.72	C	0.004	0.002	No	No
26	Irvine Ave at Mesa Dr	S	0.47	A	0.68	B	0.47	A	0.68	B	0.002	0.001	No	No
27	Bristol St N at Birch St	S	0.67	B	0.61	B	0.67	B	0.61	B	0.002	0.002	No	No

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

*** Level of Service E is acceptable at this intersection.**

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

CEQA (Cumulative Conditions) Analysis

CEQA requires that a Cumulative Conditions analysis be conducted. The Cumulative Conditions analysis includes traffic from Cumulative Projects in the vicinity of the project.

Cumulative Projects consist of the Committed Projects (approved projects in the City of Newport Beach), as well as other projects that are in various stages of the application and approval process, but have not yet been approved. These projects are considered to be "reasonably foreseeable" projects, and must therefore be analyzed for CEQA purposes. The Cumulative Projects list includes the projects identified by the City of Newport Beach as Committed Projects, plus pending projects in the City of Newport Beach, as well as approved and pending projects in the City of Irvine. A summary of Cumulative Projects is provided on **Table 8**. The location of the Cumulative Projects in relation to the project site is shown on **Figure 13.** Cumulative Projects information and data provided by the City of Newport Beach and the City of Irvine are provided in ***Appendix C***.

The CEQA Cumulative Conditions analysis was conducted for the following scenarios:

- CEQA Analysis Year 2022 Without Project
- CEQA Analysis Year 2022 With Project

Future Year Cumulative Conditions peak hour traffic volumes for the City of Newport Beach intersections were developed by adding an ambient growth rate of one percent per year to existing volumes on primary roadways and then adding peak hour traffic volumes from the Cumulative Projects.

For the City of Irvine intersections, City of Irvine transportation planning staff provided peak hour traffic forecasts from the Irvine Traffic Analysis Model (ITAM) which is maintained and operated by the City. The ITAM forecasts include the effects of ambient traffic growth and traffic from Cumulative Projects; the forecasts are presented in ***Appendix C***. ITAM forecasts represent year 2017 traffic volumes; therefore, City of Irvine staff recommended applying a growth factor of 2% per year to develop Year 2022 forecasts.

TABLE 8
SUMMARY OF CUMULATIVE PROJECTS

Project No.	Project Name	Location	Existing Use	Project Description
City of Newport Beach				
1	ExplorOcean	600 E. Bay Avenue 209 Washington Street 600 and 608 Balboa Avenue 200 Palm Street	26,219 SF Commercial	70,295 SF of Ocean Literacy Facility 6,500 SF Floating Classroom
2	Harbor Pointe Senior Living (PA2015-210)	101 Bayview Place	Restaurant	90,000 SF of convalescent and congregate care facility with 121 beds
3	Newport Coast	Newport Coast Drive	2,807-Acre State Park	3,180 DU Single-Family Detached Residential
City of Irvine				
4	PA 35 Adult Daycare	Irvine	3,422 SF Office	3,422 SF Community Facility
5	Concordia University	1530 Concordia	N/A	336,785 SF Institutional 330-Room Dormitory
6	El Toro 100-Acre County Project	Marine Way north of I-5	N/A	1,876 KSF Office 2,103 DU Residential 220 KSF Retail 242 Room Hotel
7	Cultural Terrace	The Orange County Great Park	N/A	260 Acre Master Plan
8	Cemetery	s/o Irvine Blvd, PA51	N/A	125 Acre
9	Kawasaki	9950 Jeronimo Road	N/A	80 KSF Office
10	West Alton Apartments	North Side of Irvine Blvd	N/A	970 DU Condominiums
11	Colton Apartments	Campus Dr/Martin Ct/Von Karman Ave	N/A	876 DU Apartments
12	Kilroy Apartments	17150 Von Karman Avenue	N/A	469 DU Apartments
13	17861 Cartwright	17861 Cartwright	N/A	45 DU Residential
14	2660 Barranca & 1652 Millikan	2660 Barranca & 1652 Millikan	N/A	136 DU Residential
15	2652 White Rd	2652 White Rd	N/A	165 DU Residential
16	17811-17817 Gillette Ave	17811-17817 Gillette Ave	N/A	44 DU Residential
17	17822 Gillette Ave	17822 Gillette Ave	N/A	149 DU Apartments
18	2152 Alton Apartments	2152 Alton	N/A	357 DU Apartments
19	Boardwalk	18691 Jamboree Road	N/A	458 KSF Office
20	Irvine Canaan Church (ICCCC)	16808 Armstrong Ave.	N/A	13.434 KSF Church 11.295 KSF Child Care
21	2602 McGaw Apartments	2602 McGaw Ave	N/A	120 DU Apartments
22	Parcel 3/Diamond Jamboree Retail	Diamond Jamboree Retail Center	N/A	25,000 SF Retail
23	17850 Von Karman Office	17850 Von Karman Avenue	N/A	242,497 SF Office
24	1400 Reynolds Avenue	1400 Reynolds Avenue	N/A	39,200 SF Medical Office Building
25	John Wayne Airport	Airport Way	N/A	12.5 MAP
26	UCI LRDP	UCI	N/A	Campus Master Plan

DU = Dwelling Units, SF = Square Feet, KSF = Thousand Square Feet, MAP = Million Annual Passengers

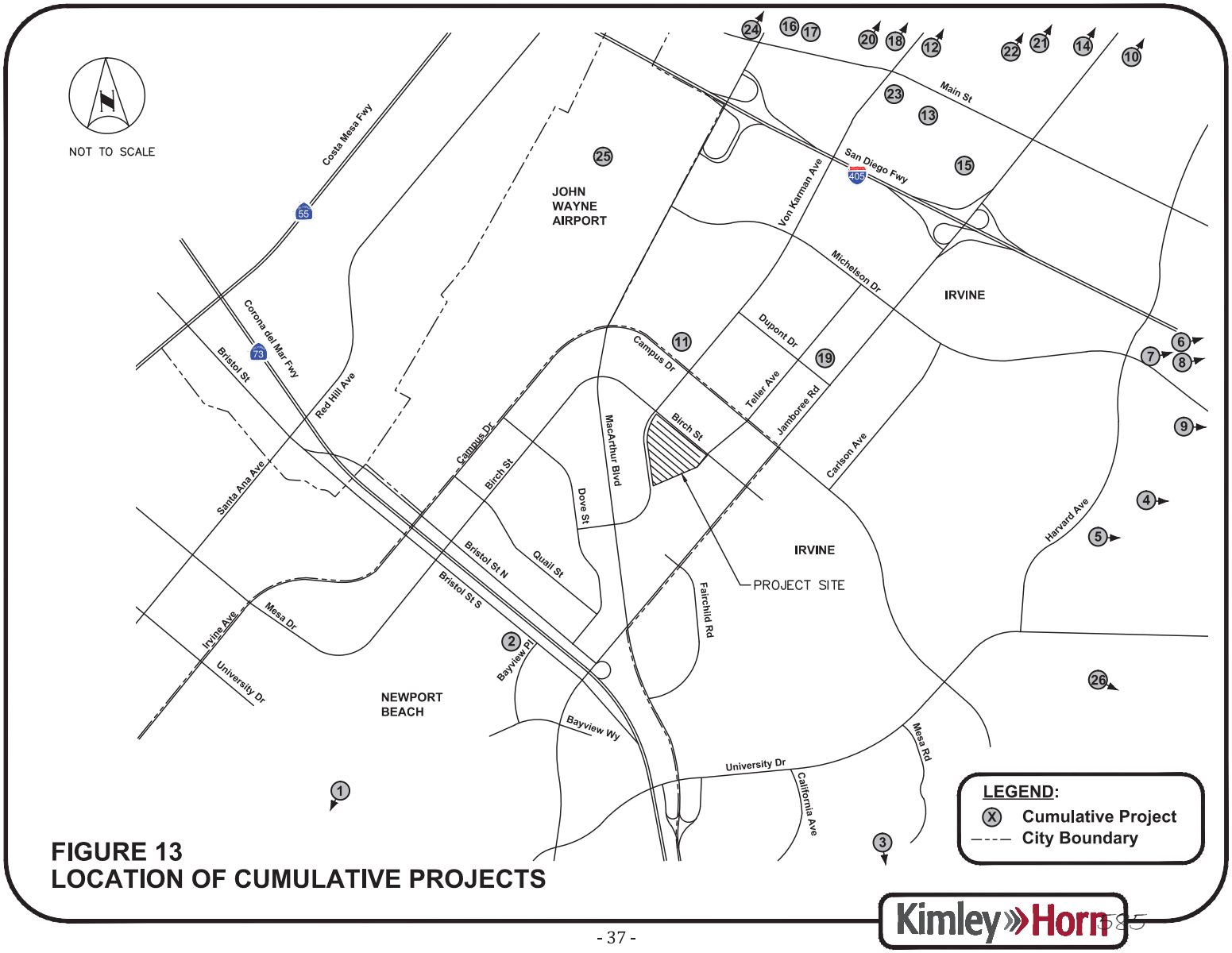

FIGURE 13
LOCATION OF CUMULATIVE PROJECTS

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CEQA Analysis Year 2022 Without Project

CEQA Analysis Year 2022 Without Project peak hour traffic volumes for all study intersections are shown on **Figure 14**. CEQA Analysis Year 2022 Without Project intersection operations are summarized on **Table 9**. As was the case with the TPO Analysis, the following intersections would operate at an unacceptable Level of Service under CEQA Analysis Year 2022 Without Project:

- 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
- 13. Jamboree Road at Michelson Drive (PM: LOS F)

All other study intersections are forecasted to operate at an acceptable Level of Service in both peak hours.

CEQA Analysis Year 2022 With Project

In this scenario, project-related peak hour traffic volumes were added to the CEQA Analysis Year 2022 Without Project traffic volumes. The resulting CEQA Analysis Year 2022 With Project peak hour volumes are shown on **Figure 15**, and the resulting intersection operations are summarized on **Table 10**. The following intersections would continue to operate at an unacceptable Level of Service under CEQA Analysis Year 2022 With Project conditions:

- 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
- 13. Jamboree Road at Michelson Drive (PM: LOS F)

Based on the significance criteria set forth in this traffic study, the project impact increment does not exceed the significance threshold at either of these intersections, and would not result in a significant impact with the addition of project trips. All other intersections would operate at an acceptable Level of Service in both peak hours.

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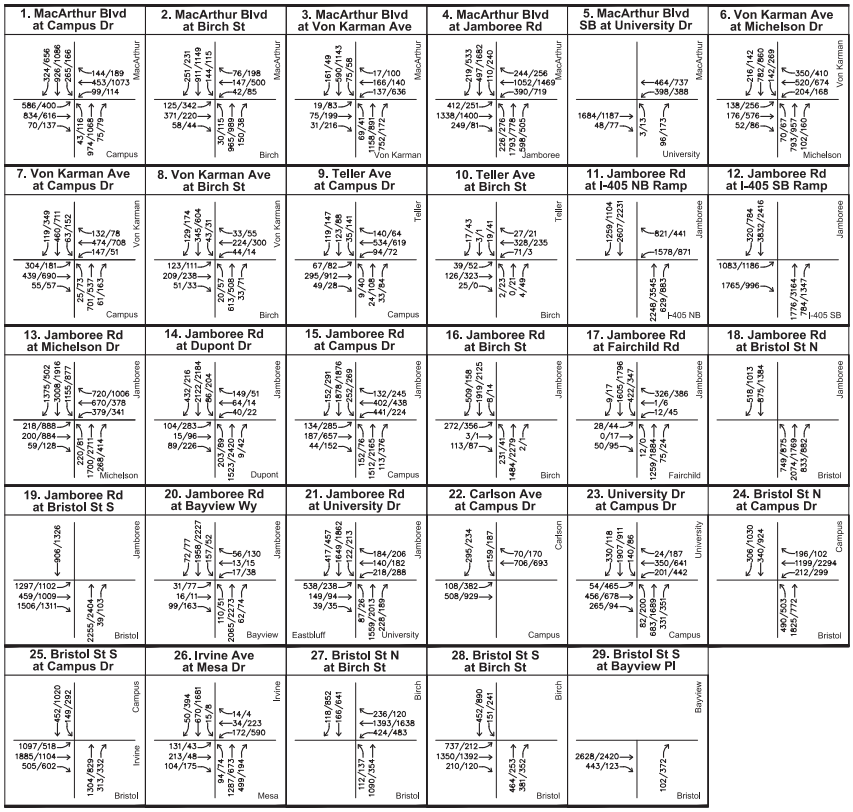

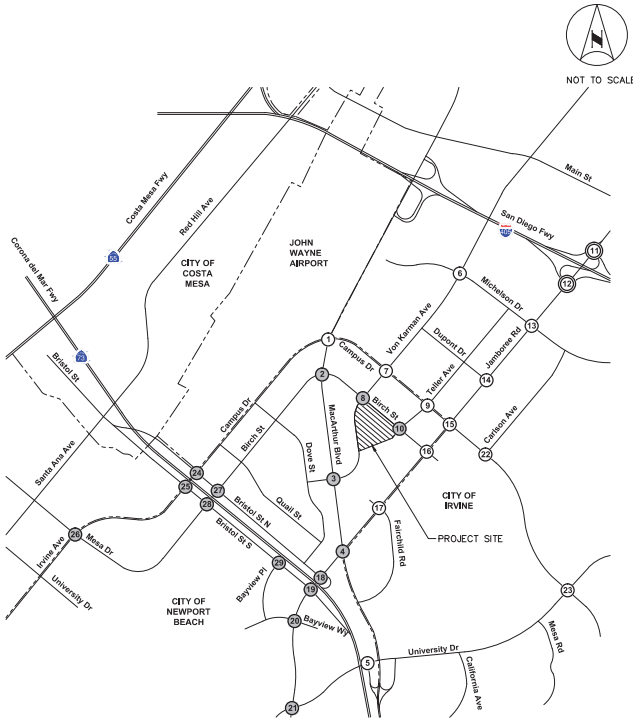

LEGEND:

- Newport Beach Intersection
- Irvine Intersection
- Caltrans Intersection
- City Boundary
- XX/YY AM/PM Peak Hour Turning Movement Volumes

FIGURE 14
CEQA ANALYSIS YEAR 2022 WITHOUT PROJECT PEAK HOUR TRAFFIC VOLUMES

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TABLE 9
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
CEQA ANALYSIS YEAR 2022 WITHOUT PROJECT

	Intersection	Int. Control	Without Project			
			AM Peak Hour		PM Peak Hour	
			ICU/ Delay	LOS	ICU/ Delay	LOS
1	MacArthur Blvd at Campus Dr *	S	0.610	B	0.832	D
2	MacArthur Blvd at Birch St	S	0.474	A	0.570	A
3	MacArthur Blvd at Von Karman Ave	S	0.632	B	0.597	A
4	MacArthur Blvd at Jamboree Rd *	S	0.756	C	0.821	D
5	MacArthur Blvd SB at University Dr	S	0.563	A	0.514	A
6	Von Karman Ave at Michelson Dr *	S	0.619	B	0.839	D
7	Von Karman Ave at Campus Dr *	S	0.650	B	0.742	C
8	Von Karman Ave at Birch St	S	0.365	A	0.388	A
9	Teller Ave at Campus Dr *	S	0.435	A	0.522	A
10	Teller Ave at Birch St	U	13.4	B	13.2	B
11	Jamboree Rd at I-405 NB Ramps *	S	0.800	C	0.916	E
12	Jamboree Rd at I-405 SB Ramps *	S	1.133	**F**	1.019	**F**
13	Jamboree Rd at Michelson Dr *	S	0.901	D	1.079	**F**
14	Jamboree Rd at Dupont Dr *	S	0.704	B	0.729	C
15	Jamboree Rd at Campus Dr *	S	0.677	B	0.762	C
16	Jamboree Rd at Birch St *	S	0.643	B	0.610	B
17	Jamboree Rd at Fairchild Rd *	S	0.643	B	0.779	C
18	Jamboree Rd at Bristol St N	S	0.408	A	0.590	A
19	Jamboree Rd at Bristol St S	S	0.757	C	0.753	C
20	Jamboree Rd at Bayview Wy	S	0.503	A	0.525	A
21	Jamboree Rd at University Dr	S	0.687	B	0.688	B
22	Carlson Ave at Campus Dr *	S	0.522	A	0.734	C
23	University Dr at Campus Dr[1]	S	0.841	D	0.869	D
24	Bristol St N at Campus Dr	S	0.598	A	0.746	C
25	Bristol St S at Campus Dr / Irvine Ave	S	0.761	C	0.643	B
26	Irvine Ave at Mesa Dr	S	0.474	A	0.690	B
27	Bristol St N at Birch St	S	0.680	B	0.642	B
28	Bristol St S at Birch St	S	0.505	A	0.593	A
29	Bristol St S at Bayview Pl	S	0.443	A	0.494	A

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

* Level of Service E is acceptable at this intersection.

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and in average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

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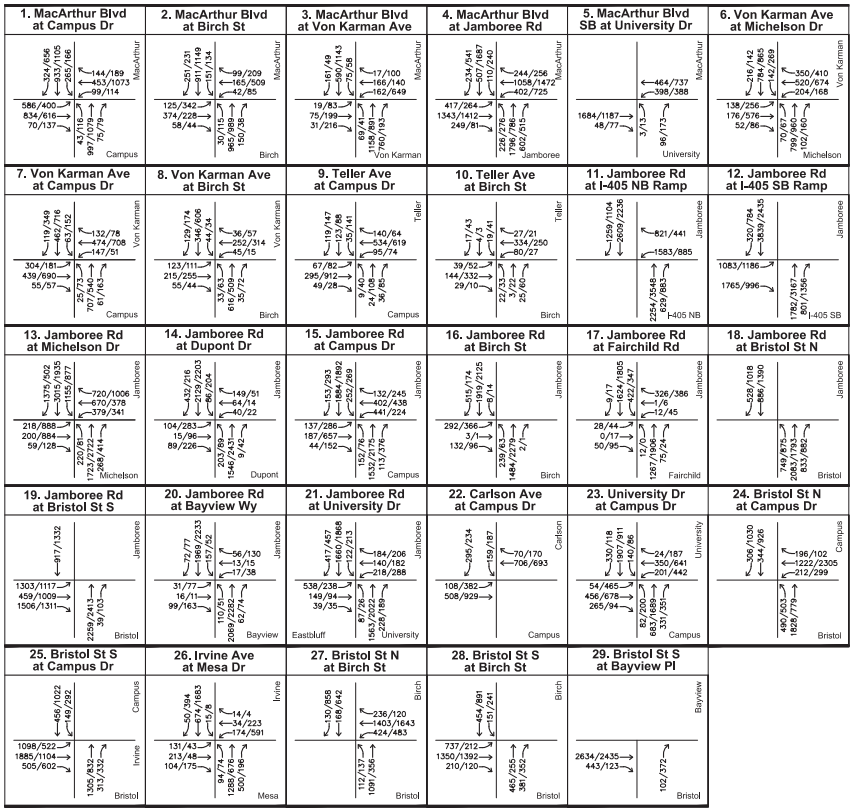

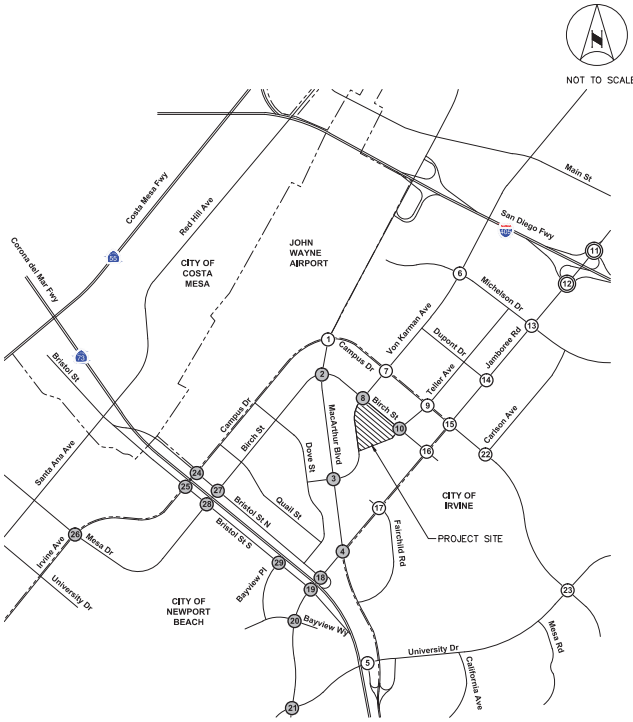

LEGEND:

- Newport Beach Intersection
- Irvine Intersection
- Caltrans Intersection
- City Boundary
- XX/YY AM/PM Peak Hour Turning Movement Volumes

FIGURE 15
CEQA ANALYSIS YEAR 2022 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

TABLE 10
KOLL CENTER RESIDENCES
SUMMARY OF INTERSECTION OPERATION
CEQA ANALYSIS YEAR 2022 WITH PROJECT

	Intersection	Without Project				With Project				Project Impact			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		Change		Significant ?	
		ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	AM	PM	AM	PM
1	MacArthur Blvd at Campus Dr *	0.610	B	0.832	D	0.614	B	0.832	D	0.004	0.000	No	No
2	MacArthur Blvd at Birch St	0.474	A	0.570	A	0.485	A	0.575	A	0.011	0.005	No	No
3	MacArthur Blvd at Von Karman Ave	0.632	B	0.597	A	0.637	B	0.601	B	0.005	0.004	No	No
4	MacArthur Blvd at Jamboree Rd *	0.756	C	0.821	D	0.759	C	0.827	D	0.003	0.006	No	No
5	MacArthur Blvd SB at University Dr	0.563	A	0.514	A	0.563	A	0.514	A	0.000	0.000	No	No
6	Von Karman Ave at Michelson Dr *	0.619	B	0.839	D	0.619	B	0.840	D	0.000	0.001	No	No
7	Von Karman Ave at Campus Dr *	0.650	B	0.742	C	0.652	B	0.744	C	0.002	0.002	No	No
8	Von Karman Ave at Birch St	0.365	A	0.388	A	0.376	A	0.396	A	0.011	0.008	No	No
9	Teller Ave at Campus Dr *	0.435	A	0.522	A	0.435	A	0.523	A	0.000	0.001	No	No
10	Teller Ave at Birch St	13.4	B	13.2	B	14.2	B	14.8	B	0.8	1.6	No	No
11	Jamboree Rd at I-405 NB Ramps *	0.800	C	0.916	E	0.802	C	0.919	E	0.002	0.003	No	No
12	Jamboree Rd at I-405 SB Ramps *	1.133	**F**	1.019	**F**	1.134	**F**	1.020	**F**	0.001	0.001	No	No
13	Jamboree Rd at Michelson Dr *	0.901	D	1.079	**F**	0.904	D	1.080	**F**	0.003	0.001	No	No
14	Jamboree Rd at Dupont Dr *	0.704	B	0.729	C	0.705	C	0.730	C	0.001	0.001	No	No
15	Jamboree Rd at Campus Dr *	0.677	B	0.762	C	0.679	B	0.764	C	0.002	0.002	No	No
16	Jamboree Rd at Birch St *	0.643	B	0.610	B	0.653	B	0.613	B	0.010	0.003	No	No
17	Jamboree Rd at Fairchild Rd *	0.643	B	0.779	C	0.645	B	0.784	C	0.002	0.005	No	No
18	Jamboree Rd at Bristol St N	0.408	A	0.590	A	0.411	A	0.592	A	0.003	0.002	No	No
19	Jamboree Rd at Bristol St S	0.757	C	0.753	C	0.758	C	0.757	C	0.001	0.004	No	No
20	Jamboree Rd at Bayview Wy	0.503	A	0.525	A	0.504	A	0.526	A	0.001	0.001	No	No
21	Jamboree Rd at University Dr	0.687	B	0.688	B	0.689	B	0.690	B	0.002	0.002	No	No
22	Carlson Ave at Campus Dr *	0.522	A	0.734	C	0.522	A	0.734	C	0.000	0.000	No	No
23	University Dr at Campus Dr[1]	0.841	D	0.869	D	0.841	D	0.869	D	0.000	0.000	No	No
24	Bristol St N at Campus Dr	0.598	A	0.746	C	0.602	A	0.748	C	0.004	0.002	No	No
25	Bristol St S at Campus Dr / Irvine Ave	0.761	C	0.643	B	0.762	C	0.644	B	0.001	0.001	No	No
26	Irvine Ave at Mesa Dr	0.474	A	0.690	B	0.475	A	0.691	B	0.001	0.001	No	No
27	Bristol St N at Birch St	0.680	B	0.642	B	0.682	B	0.644	B	0.002	0.002	No	No
28	Bristol St S at Birch St	0.505	A	0.593	A	0.505	A	0.593	A	0.000	0.000	No	No
29	Bristol St S at Bayview Pl	0.443	A	0.494	A	0.443	A	0.497	A	0.000	0.003	No	No

Notes:

S = Signalized, U = Unsignalized, ICU = Intersection Capacity Utilization, LOS = Level of Service

Bold and shaded values indicate intersections operating at an unacceptable LOS.

* Level of Service E is acceptable at this intersection.

- Intersection operation is expressed in terms of volume-to-capacity (v/c) ratio for signalized intersections using the ICU Methodology, and average seconds of delay per vehicle during the peak hour for unsignalized intersections using the HCM Methodology.

[1] A 5% capacity credit is applied at this intersection to reflect implementation of the Advanced Transportation Management System (ATMS)

CITY OF IRVINE ROADWAY SEGMENT ANALYSIS

Roadway segments within the City of Irvine were analyzed in accordance with the City of Irvine Traffic Impact Analysis Guidelines. Forty-six roadway segments within the project vicinity were analyzed for each study scenario. Per the City's guidelines, the daily roadway capacities for each facility type are shown below. The capacity for facility types not listed below are interpolated, as directed by the City. The study roadway segments are shown on **Figure 16**.

Facility Type	Number of Lanes	Daily Capacity	
		LOS D	LOS E
Freeways	10	189,000	210,000
	8	158,400	176,000
	6	121,500	135,000
	4	81,000	90,000
Freeway Ramps	2	19,800	22,000
	1	14,400	16,000
Expressway	6	121,500	135,000
Major Highway	8	64,800	72,000
	6	48,600	54,000
Primary Highway	4	28,800	32,000
Secondary Highway	4	25,200	28,000
Commuter	2	11,700	13,000
Commuter (Rural)	2	16,200	18,000

Roadway segments that operate deficiently on a daily basis (LOS E or worse) require a Peak Hour Link Analysis (PHLA), as defined by the City of Irvine's "Revised Peak Hour Link Analysis Methodology (December 1996)" publication. The PHLA specifies that the hourly capacity for a single lane is 1,600 vehicles per hour. Where the distance between controlled intersections exceeds one mile, the lane capacity is 2,000 vehicles per hour. The City of Irvine requires mitigation for impacts that are equal to or greater than 0.02 on a roadway segment that operates at a deficient Level of Service based on the PHLA analysis.

Daily traffic volumes were obtained from City of Irvine staff, and are based on existing traffic counts, and 2020 ITAM forecasts. Older roadway counts were grown at a rate of 2% per year to be consistent with Existing Conditions. ITAM 2020 forecasts were grown at a rate of 2% per year to be consistent with the CEQA Analysis Year 2022 scenarios. Peak hour volumes, if needed for the PHLA, were taken from the peak hour intersection volumes in this report.

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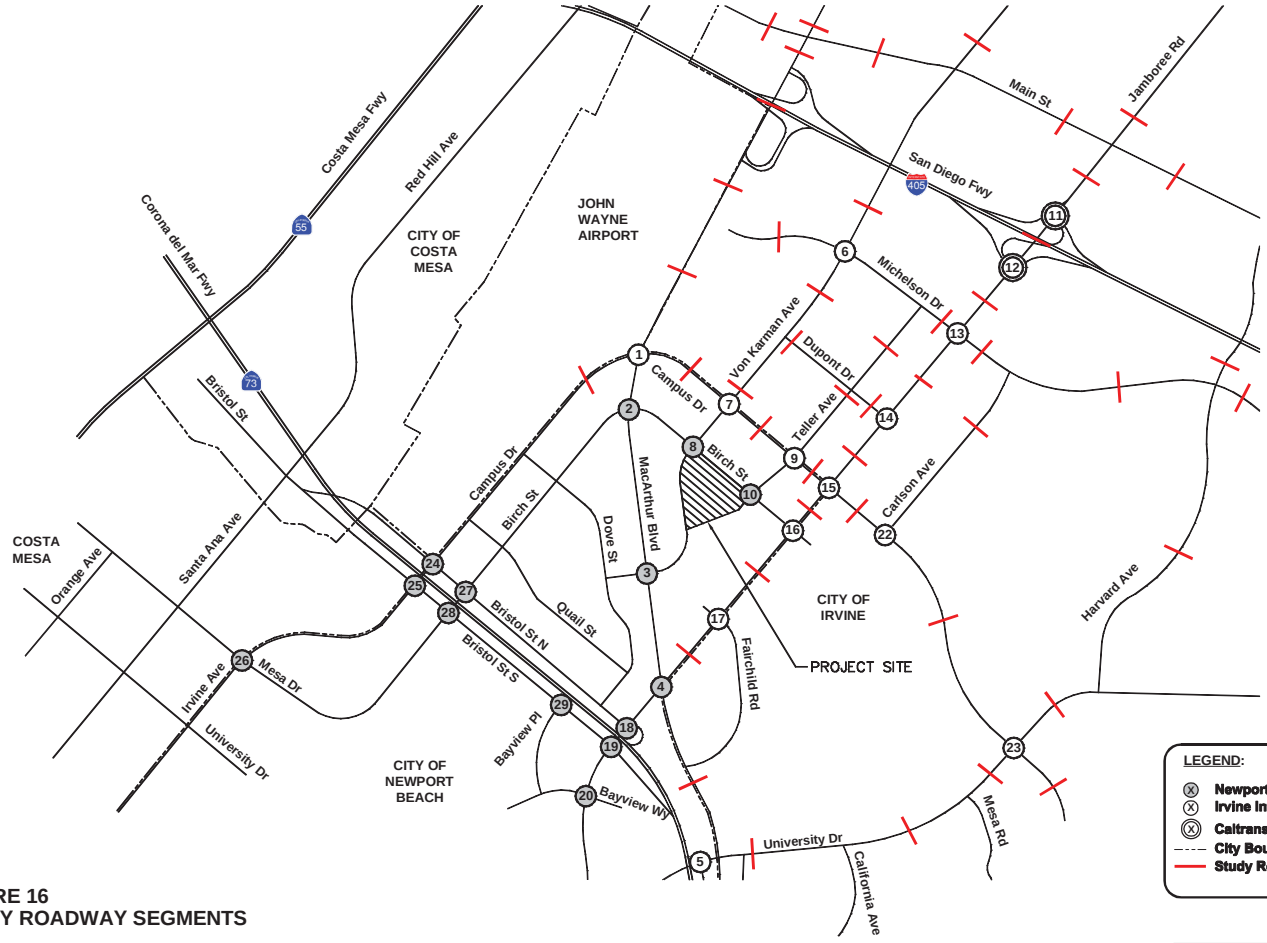

FIGURE 16
STUDY ROADWAY SEGMENTS

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Existing Conditions

Existing roadway operations are summarized on **Table 11**. This table indicates that the following roadway segments are currently operating at a deficient Level of Service based on daily volumes:

- Jamboree Road: Main Street to I-405 Northbound Ramp
- Jamboree Road: Between I-405 Northbound Ramp and I-405 Southbound Ramp
- Jamboree Road: I-405 Southbound Ramp to Michelson Drive
- Campus Drive: Carlson Avenue to University Drive
- University Drive: California Avenue to Mesa Road
- University Drive: Mesa Road to Campus Drive

These segments were further analyzed using the PHLA methodology, and the results are shown on **Table 12**. Review of Table 12 indicates that these roadway segments operate at LOS C or better during the peak hours under Existing Conditions.

Existing Plus Project

Existing Plus Project roadway operations are summarized on **Table 13**. Review of Table 13 indicates that the following roadway segments will continue to be deficient with the addition of project traffic:

- Jamboree Road: Main Street to I-405 Northbound Ramp
- Jamboree Road: Between I-405 Northbound Ramp and I-405 Southbound Ramp
- Jamboree Road: I-405 Southbound Ramp to Michelson Drive
- Campus Drive: Carlson Avenue to University Drive
- University Drive: California Avenue to Mesa Road
- University Drive: Mesa Road to Campus Drive

These segments were further analyzed using the PHLA methodology, and the results are shown on **Table 14**. Review of Table 14 indicates that these roadway segments will continue to operate at LOS C or better during the peak hours with the addition of project traffic.

TABLE 11
CITY OF IRVINE ROADWAY SEGMENT ANALYSIS
EXISTING CONDITIONS

Roadway	Segment	Facility Type	Number of Lanes	LOS E Capacity	Traffic Volume	V/C	LOS
MacArthur Boulevard	North of Main Street	Major	7	63,000	26,939	0.428	A
	Main Street to I-405 NB Ramps	Major	8	72,000	35,479	0.493	A
	Between I-405 NB and SB Ramps	Major	8	72,000	51,177	0.711	C
	I-405 SB Ramps to Michelson	Major	8	72,000	52,637	0.731	C
	Michelson to Campus	Major	8	72,000	35,873	0.498	A
	Jamboree to University	Major	6	54,000	39,361	0.729	C
Von Karman Ave	North of Main Street	Secondary	4	28,000	21,662	0.774	C
	Main to Michelson	Secondary	4	28,000	22,999	0.821	D
	Michelson to Dupont	Secondary	4	28,000	16,965	0.606	B
	Dupont to Campus	Secondary	4	28,000	16,965	0.606	B
Teller Avenue	Michelson to Dupont	Commuter	2	13,000	5,566	0.428	A
	Dupont to Campus	Commuter	2	13,000	2,955	0.227	A
Jamboree Road	North of Main Street	Major	8	72,000	63,067	0.876	D
	Main to I-405 NB Ramps	Major	8	72,000	70,074	**0.973**	**E**
	Between I-405 NB and SB Ramps	Major	8	72,000	78,431	**1.089**	**F**
	I-405 SB Ramps to Michelson	Major	8	72,000	71,095	**0.987**	**E**
	Michelson to Dupont	Major	8	72,000	45,474	0.632	B
	Dupont to Campus	Major	7	63,000	41,587	0.660	B
	Campus to Birch	Major	7	63,000	39,071	0.620	B
	Birch to Fairchild	Major	7	63,000	41,102	0.652	B
	Fairchild to MacArthur	Major	7	63,000	33,314	0.529	A
Carlson Avenue	Michelson to Campus	Secondary	4	28,000	6,128	0.219	A
Harvard Avenue	North of Michelson	Primary	4	32,000	25,439	0.795	C
	Michelson to University	Primary	4	32,000	19,009	0.594	A
Main Street	West of MacArthur	Major	6	54,000	23,739	0.440	A
	MacArthur to Von Karman	Major	6	54,000	29,325	0.543	A
	Von Karman to Jamboree	Major	6	54,000	24,984	0.463	A
	East of Jamboree	Major	6	54,000	23,323	0.432	A
Michelson Drive	MacArthur to Von Karman	Secondary	4	28,000	10,635	0.380	A
	Von Karman to Jamboree	Secondary	4	28,000	15,386	0.550	A
	Jamboree to Carlson	Primary	4	32,000	20,475	0.640	B
	Carlson to Harvard	Primary	4	32,000	20,475	0.640	B
	East of Harvard	Primary	4	32,000	17,894	0.559	A
Dupont Drive	Von Karman to Teller	Secondary	4	28,000	4,176	0.149	A
	Teller Ave to Jamboree	Secondary	4	28,000	3,021	0.108	A
Campus Drive	West of MacArthur	Major	6	54,000	29,714	0.550	A
	MacArthur to Von Karman	Primary	4	32,000	13,075	0.409	A
	Von Karman Ave to Teller	Secondary	4	28,000	11,189	0.400	A
	Teller to Jamboree	Secondary	4	28,000	11,186	0.400	A
	Jamboree to Carlson	Secondary	4	28,000	18,431	0.658	B
	Carlson to University	Commuter	2	13,000	18,427	**1.417**	**F**
	East of University	Secondary	4	28,000	22,648	0.809	D
University Drive	MacArthur to California	Primary	4	32,000	24,765	0.774	C
	California to Mesa	Primary	4	32,000	30,386	**0.950**	**E**
	Mesa to Campus	Primary	4	32,000	30,580	**0.956**	**E**
	Campus to Harvard	Major	6	54,000	25,303	0.469	A

Bold and shaded values indicate a deficient Level of Service, based on the City of Irvine Traffic Impact Analysis Guidelines

TABLE 12
PEAK HOUR LINK ANALYSIS
EXISTING CONDITIONS

Roadway	Segment	Direction	# Lanes	Capacity	AM Peak			PM Peak		
					Volume	V/C	LOS	Volume	V/C	LOS
Jamboree Road	Main Street to I-405 NB Ramps	Northbound	4	6,400	2,641	0.413	A	3,520	0.550	A
		Southbound	4	6,400	3,279	0.512	A	2,773	0.433	A
	I-405 NB Ramps to I-405 SB Ramps	Northbound	4	6,400	2,561	0.400	A	3,657	0.571	A
		Southbound	4	6,400	3,306	0.517	A	2,592	0.405	A
	I-405 SB Ramps to Michelson Drive	Northbound	4	6,400	1,877	0.293	A	3,647	0.570	A
		Southbound	4	6,400	4,530	0.708	C	2,654	0.415	A
Campus Drive	Carlson Avenue to University Drive	Eastbound	1	1,600	525	0.328	A	1,084	0.678	B
		Westbound	1	1,600	702	0.439	A	696	0.435	A
University Drive	California Avenue to Mesa Road	Eastbound	2	3,200	1,222	0.382	A	1,826	0.571	A
		Westbound	2	3,200	2,143	0.670	B	1,468	0.459	A
	Mesa Road to Campus Drive	Eastbound	2	3,200	1,222	0.382	A	1,826	0.571	A
		Westbound	2	3,200	2,143	0.670	B	1,468	0.459	A

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TABLE 13
ROADWAY SEGMENT ANALYSIS
EXISTING PLUS PROJECT CONDITIONS

Roadway	Segment	LOS E Capacity	Existing Conditions			Existing plus Project				Project Impact/ Significance	
			Traffic Volume	V/C	LOS	Project Traffic	Traffic Volume	V/C	LOS	Project Impact	Signif -icant?
MacArthur Boulevard	North of Main Street	63,000	26,939	0.428	A	60	26,999	0.429	A	0.001	No
	Main Street to I-405 NB Ramps	72,000	35,479	0.493	A	60	35,539	0.494	A	0.001	No
	Between I-405 NB and SB Ramps	72,000	51,177	0.711	C	151	51,328	0.713	C	0.002	No
	I-405 SB Ramps to Michelson	72,000	52,637	0.731	C	242	52,879	0.734	C	0.003	No
	Michelson to Campus	72,000	35,873	0.498	A	242	36,115	0.502	A	0.003	No
	Jamboree to University	54,000	39,361	0.729	C	240	39,601	0.733	C	0.004	No
Von Karman Ave	North of Main Street	28,000	21,662	0.774	C	60	21,722	0.776	C	0.002	No
	Main to Michelson	28,000	22,999	0.821	D	60	23,059	0.824	D	0.002	No
	Michelson to Dupont	28,000	16,965	0.606	B	60	17,025	0.608	B	0.002	No
	Dupont to Campus	28,000	16,965	0.606	B	60	17,025	0.608	B	0.002	No
Teller Avenue	Michelson to Dupont	13,000	5,566	0.428	A	0	5,566	0.428	A	0.000	No
	Dupont to Campus	13,000	2,955	0.227	A	0	2,955	0.227	A	0.000	No
Jamboree Road	North of Main Street	72,000	63,067	0.876	D	60	63,127	0.877	D	0.001	No
	Main to I-405 NB Ramps	72,000	70,074	**0.973**	**E**	150	70,224	**0.975**	**E**	0.002	No
	Between I-405 NB and SB Ramps	72,000	78,431	**1.089**	**F**	150	78,581	**1.091**	**F**	0.002	No
	I-405 SB Ramps to Michelson	72,000	71,095	**0.987**	**E**	242	71,337	**0.991**	**E**	0.003	No
	Michelson to Dupont	72,000	45,474	0.632	B	242	45,716	0.635	B	0.003	No
	Dupont to Campus	63,000	41,587	0.660	B	242	41,829	0.664	B	0.004	No
	Campus to Birch	63,000	39,071	0.620	B	212	39,283	0.624	B	0.003	No
	Birch to Fairchild	63,000	41,102	0.652	B	242	41,344	0.656	B	0.004	No
	Fairchild to MacArthur	63,000	33,314	0.529	A	242	33,556	0.533	A	0.004	No
Carlson Avenue	Michelson to Campus	28,000	6,128	0.219	A	0	6,128	0.219	A	0.000	No
Harvard Avenue	North of Michelson	32,000	25,439	0.795	C	0	25,439	0.795	C	0.000	No
	Michelson to University	32,000	19,009	0.594	A	0	19,009	0.594	A	0.000	No
Main Street	West of MacArthur	54,000	23,739	0.440	A	0	23,739	0.440	A	0.000	No
	MacArthur to Von Karman	54,000	29,325	0.543	A	0	29,325	0.543	A	0.000	No
	Von Karman to Jamboree	54,000	24,984	0.463	A	0	24,984	0.463	A	0.000	No
	East of Jamboree	54,000	23,323	0.432	A	0	23,323	0.432	A	0.000	No
Michelson Drive	MacArthur to Von Karman	28,000	10,635	0.380	A	0	10,635	0.380	A	0.000	No
	Von Karman to Jamboree	28,000	15,386	0.550	A	0	15,386	0.550	A	0.000	No
	Jamboree to Carlson	32,000	20,475	0.640	B	0	20,475	0.640	B	0.000	No
	Carlson to Harvard	32,000	20,475	0.640	B	0	20,475	0.640	B	0.000	No
	East of Harvard	32,000	17,894	0.559	A	0	17,894	0.559	A	0.000	No
Dupont Drive	Von Karman to Teller	28,000	4,176	0.149	A	0	4,176	0.149	A	0.000	No
	Teller Ave to Jamboree	28,000	3,021	0.108	A	0	3,021	0.108	A	0.000	No
Campus Drive	West of MacArthur	54,000	29,714	0.550	A	0	29,714	0.550	A	0.000	No
	MacArthur to Von Karman	32,000	13,075	0.409	A	0	13,075	0.409	A	0.000	No
	Von Karman Ave to Teller	28,000	11,189	0.400	A	0	11,189	0.400	A	0.000	No
	Teller to Jamboree	28,000	11,186	0.400	A	30	11,216	0.401	A	0.001	No
	Jamboree to Carlson	28,000	18,431	0.658	B	0	18,431	0.658	B	0.000	No
	Carlson to University	13,000	18,427	**1.417**	**F**	0	18,427	**1.417**	**F**	0.000	No
	East of University	28,000	22,648	0.809	D	0	22,648	0.809	D	0.000	No
University Drive	MacArthur to California	32,000	24,765	0.774	C	0	24,765	0.774	C	0.000	No
	California to Mesa	32,000	30,386	**0.950**	**E**	0	30,386	**0.950**	**E**	0.000	No
	Mesa to Campus	32,000	30,580	**0.956**	**E**	0	30,580	**0.956**	**E**	0.000	No
	Campus to Harvard	54,000	25,303	0.469	A	0	25,303	0.469	A	0.000	No

Bold and shaded values indicate a deficient Level of Service, based on the City of Irvine Traffic Impact Analysis Guidelines

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TABLE 14
PEAK HOUR LINK ANALYSIS
EXISTING PLUS PROJECT

Roadway	Segment	Direction	# Lanes	Capacity	AM Peak			PM Peak		
					Volume	V/C	LOS	Volume	V/C	LOS
Jamboree Road	Main Street to I-405 NB Ramps	Northbound	4	6,400	2,647	0.414	A	3,523	0.550	A
		Southbound	4	6,400	3,281	0.513	A	2,778	0.434	A
	I-405 NB Ramps to I-405 SB Ramps	Northbound	4	6,400	2,567	0.401	A	3,660	0.572	A
		Southbound	4	6,400	3,313	0.518	A	2,611	0.408	A
	I-405 SB Ramps to Michelson Drive	Northbound	4	6,400	1,900	0.297	A	3,659	0.572	A
		Southbound	4	6,400	4,537	0.709	C	2,673	0.418	A
Campus Drive	Carlson Avenue to University Drive	Eastbound	1	1,600	525	0.328	A	1,084	0.678	B
		Westbound	1	1,600	702	0.439	A	696	0.435	A
University Drive	California Avenue to Mesa Road	Eastbound	2	3,200	1,222	0.382	A	1,826	0.571	A
		Westbound	2	3,200	2,143	0.670	B	1,468	0.459	A
	Mesa Road to Campus Drive	Eastbound	2	3,200	1,222	0.382	A	1,826	0.571	A
		Westbound	2	3,200	2,143	0.670	B	1,468	0.459	A

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CEQA Analysis Year 2022 Without Project

CEQA Analysis Year 2022 Without Project roadway operations are summarized on **Table 15**. Review of Table 15 indicates that the following roadway segments will be deficient in the CEQA Analysis Year 2022 Without Project scenario:

- Von Karman Avenue: North of Main Street
- Von Karman Avenue: Main Street to Michelson Drive
- Jamboree Road: North of Main Street
- Jamboree Road: Main Street to I-405 Northbound Ramp
- Jamboree Road: Between I-405 Northbound Ramp and I-405 Southbound Ramp
- Jamboree Road: I-405 Southbound Ramp to Michelson Drive
- Campus Drive: Carlson Avenue to University Drive
- University Drive: California Avenue to Mesa Road
- University Drive: Mesa Road to Campus Drive

These segments were further analyzed using the PHLA methodology, and the results are shown on **Table 16**. Review of Table 16 indicates that these roadway segments will operate at LOS D or better during the peak hours in the CEQA Analysis Year 2022 Without Project scenario.

CEQA Analysis Year 2022 With Project

CEQA Analysis Year 2022 With Project roadway operations are summarized on **Table 17**. Review of this table indicates that the following roadway segments will continue to be deficient with the addition of project traffic:

- Von Karman Avenue: North of Main Street
- Von Karman Avenue: Main Street to Michelson Drive
- Jamboree Road: North of Main Street
- Jamboree Road: Main Street to I-405 Northbound Ramp
- Jamboree Road: Between I-405 Northbound Ramp and I-405 Southbound Ramp
- Jamboree Road: I-405 Southbound Ramp to Michelson Drive
- Campus Drive: Carlson Avenue to University Drive
- University Drive: California Avenue to Mesa Road
- University Drive: Mesa Road to Campus Drive

These segments were further analyzed using the PHLA methodology, and the results are shown on **Table 18**. Review of Table 18 indicates that these roadway segments will continue to operate at LOS D or better during the peak hours with the addition of project traffic.

TABLE 15
ROADWAY SEGMENT ANALYSIS
CEQA ANALYSIS YEAR 2022 WITHOUT PROJECT

Roadway	Segment	Number of Lanes	LOS E Capacity	Traffic Volume	V/C	LOS
MacArthur Boulevard	North of Main Street	7	63,000	34,645	0.550	A
	Main Street to I-405 NB Ramps	8	72,000	53,893	0.749	C
	Between I-405 NB and SB Ramps	8	72,000	55,245	0.767	C
	I-405 SB Ramps to Michelson	8	72,000	59,303	0.824	D
	Michelson to Campus	8	72,000	38,911	0.540	A
	Jamboree to University	6	54,000	21,640	0.401	A
Von Karman Avenue	North of Main Street	4	28,000	26,738	**0.955**	**E**
	Main to Michelson	4	28,000	28,299	**1.011**	**F**
	Michelson to Dupont	4	28,000	19,351	0.691	B
	Dupont to Campus	4	28,000	19,247	0.687	B
Teller Avenue	Michelson to Dupont	2	13,000	8,011	0.616	B
	Dupont to Campus	2	13,000	5,514	0.424	A
Jamboree Road	North of Main Street	8	72,000	71,163	**0.988**	**E**
	Main to I-405 NB Ramps	8	72,000	76,261	**1.059**	**F**
	Between I-405 NB and SB Ramps	8	72,000	65,025	**0.903**	**E**
	I-405 SB Ramps to Michelson	8	72,000	87,498	**1.215**	**F**
	Michelson to Dupont	8	72,000	61,592	0.855	D
	Dupont to Campus	7	63,000	47,754	0.758	C
	Campus to Birch	7	63,000	45,570	0.723	C
	Birch to Fairchild	7	63,000	44,841	0.712	C
	Fairchild to MacArthur	7	63,000	39,327	0.624	B
Carlson Avenue	Michelson to Campus	4	28,000	9,156	0.327	A
Harvard Avenue	North of Michelson	4	32,000	25,802	0.806	D
	Michelson to University	4	32,000	19,247	0.601	A
Main Street	West of MacArthur	6	54,000	27,050	0.501	A
	MacArthur to Von Karman	6	54,000	35,270	0.653	B
	Von Karman to Jamboree	6	54,000	28,403	0.526	A
	East of Jamboree	6	54,000	24,449	0.453	A
Michelson Drive	MacArthur to Von Karman	4	28,000	22,681	0.810	D
	Von Karman to Jamboree	4	28,000	21,640	0.773	C
	Jamboree to Carlson	4	32,000	26,530	0.829	D
	Carlson to Harvard	4	32,000	25,594	0.800	C
	East of Harvard	4	32,000	19,039	0.595	A
Dupont Drive	Von Karman to Teller	4	28,000	5,618	0.201	A
	Teller Ave to Jamboree	4	28,000	3,849	0.137	A
Campus Drive	West of MacArthur	6	54,000	33,397	0.618	B
	MacArthur to Von Karman	4	32,000	16,126	0.504	A
	Von Karman Ave to Teller	4	28,000	13,629	0.487	A
	Teller to Jamboree	4	28,000	12,797	0.457	A
	Jamboree to Carlson	4	28,000	20,808	0.743	C
	Carlson to University	2	13,000	19,664	**1.513**	**F**
	East of University	4	28,000	24,866	0.888	D
University Drive	MacArthur to California	4	32,000	27,154	0.849	D
	California to Mesa	4	32,000	32,877	**1.027**	**F**
	Mesa to Campus	4	32,000	33,397	**1.044**	**F**
	Campus to Harvard	6	54,000	28,507	0.528	A

Bold and shaded values indicate a deficient Level of Service, based on the City of Irvine Traffic Impact Analysis Guidelines

TABLE 16
PEAK HOUR LINK ANALYSIS
CEQA ANALYSIS YEAR 2022 WITHOUT PROJECT

Roadway	Segment	Direction	# Lanes	Capacity	AM Peak			PM Peak		
					Volume	V/C	LOS	Volume	V/C	LOS
Von Karman Avenue	North of Main Street	Northbound	2	3,200	1,281	0.400	A	1,623	0.507	A
		Southbound	2	3,200	1,140	0.356	A	1,271	0.397	A
	Main Street to Michelson Drive	Northbound	2	3,200	1,281	0.400	A	1,623	0.507	A
		Southbound	2	3,200	1,140	0.356	A	1,271	0.397	A
Jamboree Road	North of Main Street	Northbound	4	6,400	3,069	0.480	A	3,986	0.623	B
		Southbound	4	6,400	3,866	0.604	A	3,335	0.521	A
	Main Street to I-405 NB Ramps	Northbound	4	6,400	3,069	0.480	A	3,986	0.623	B
		Southbound	4	6,400	3,866	0.604	A	3,335	0.521	A
	I-405 NB Ramps to I-405 Southbound Ramps	Northbound	4	6,400	2,877	0.450	A	4,428	0.692	B
		Southbound	4	6,400	4,185	0.654	B	3,102	0.485	A
	I-405 SB Ramps to Michelson Drive	Northbound	4	6,400	2,560	0.400	A	4,511	0.705	B
		Southbound	4	6,400	5,597	0.875	D	3,412	0.533	A
Campus Drive	Carlson Avenue to University Drive	Eastbound	1	1,600	667	0.417	A	1,116	0.698	B
		Westbound	1	1,600	776	0.485	A	863	0.539	A
University Drive	California Avenue to Mesa Road	Eastbound	2	3,200	1,096	0.343	A	2,240	0.700	B
		Westbound	2	3,200	2,373	0.742	C	1,447	0.452	A
	Mesa Road to Campus Drive	Eastbound	2	3,200	1,096	0.343	A	2,240	0.700	B
		Westbound	2	3,200	2,373	0.742	C	1,447	0.452	A

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TABLE 17
ROADWAY SEGMENT ANALYSIS
CEQA ANALYSIS YEAR 2022 WITH PROJECT

Roadway	Segment	Without Project				With Project				Project Impact/ Significance	
		LOS E Capacity	Traffic Volume	V/C	LOS	Project Traffic	Traffic Volume	V/C	LOS	Project Impact	Signif -icant?
MacArthur Boulevard	North of Main Street	63,000	34,645	0.550	A	60	34,705	0.551	A	0.001	No
	Main Street to I-405 NB Ramps	72,000	53,893	0.749	C	60	53,953	0.749	C	0.001	No
	Between I-405 NB and SB Ramps	72,000	55,245	0.767	C	151	55,396	0.769	C	0.002	No
	I-405 SB Ramps to Michelson	72,000	59,303	0.824	D	242	59,545	0.827	D	0.003	No
	Michelson to Campus	72,000	38,911	0.540	A	242	39,153	0.544	A	0.003	No
	Jamboree to University	54,000	21,640	0.401	A	240	21,880	0.405	A	0.004	No
Von Karman Avenue	North of Main Street	28,000	26,738	**0.955**	**E**	60	26,798	**0.957**	**E**	0.002	No
	Main to Michelson	28,000	28,299	**1.011**	**F**	60	28,359	**1.013**	**F**	0.002	No
	Michelson to Dupont	28,000	19,351	0.691	B	60	19,411	0.693	B	0.002	No
	Dupont to Campus	28,000	19,247	0.687	B	60	19,307	0.690	B	0.002	No
Teller Avenue	Michelson to Dupont	13,000	8,011	0.616	B	0	8,011	0.616	B	0.000	No
	Dupont to Campus	13,000	5,514	0.424	A	0	5,514	0.424	A	0.000	No
Jamboree Road	North of Main Street	72,000	71,163	**0.988**	**E**	60	71,223	**0.989**	**E**	0.001	No
	Main to I-405 NB Ramps	72,000	76,261	**1.059**	**F**	150	76,411	**1.061**	**F**	0.002	No
	Between I-405 NB and SB Ramps	72,000	65,025	**0.903**	**E**	150	65,175	**0.905**	**E**	0.002	No
	I-405 SB Ramps to Michelson	72,000	87,498	**1.215**	**F**	242	87,740	**1.219**	**F**	0.003	No
	Michelson to Dupont	72,000	61,592	0.855	D	242	61,834	0.859	D	0.003	No
	Dupont to Campus	63,000	47,754	0.758	C	242	47,996	0.762	C	0.004	No
	Campus to Birch	63,000	45,570	0.723	C	212	45,782	0.727	C	0.003	No
	Birch to Fairchild	63,000	44,841	0.712	C	242	45,083	0.716	C	0.004	No
	Fairchild to MacArthur	63,000	39,327	0.624	B	242	39,569	0.628	B	0.004	No
Carlson Avenue	Michelson to Campus	28,000	9,156	0.327	A	0	9,156	0.327	A	0.000	No
Harvard Avenue	North of Michelson	32,000	25,802	0.806	D	0	25,802	0.806	D	0.000	No
	Michelson to University	32,000	19,247	0.601	A	0	19,247	0.601	A	0.000	No
Main Street	West of MacArthur	54,000	27,050	0.501	A	0	27,050	0.501	A	0.000	No
	MacArthur to Von Karman	54,000	35,270	0.653	B	0	35,270	0.653	B	0.000	No
	Von Karman to Jamboree	54,000	28,403	0.526	A	0	28,403	0.526	A	0.000	No
	East of Jamboree	54,000	24,449	0.453	A	0	24,449	0.453	A	0.000	No
Michelson Drive	MacArthur to Von Karman	28,000	22,681	0.810	D	0	22,681	0.810	D	0.000	No
	Von Karman to Jamboree	28,000	21,640	0.773	C	0	21,640	0.773	C	0.000	No
	Jamboree to Carlson	32,000	26,530	0.829	D	0	26,530	0.829	D	0.000	No
	Carlson to Harvard	32,000	25,594	0.800	C	0	25,594	0.800	C	0.000	No
	East of Harvard	32,000	19,039	0.595	A	0	19,039	0.595	A	0.000	No
Dupont Drive	Von Karman to Teller	28,000	5,618	0.201	A	0	5,618	0.201	A	0.000	No
	Teller Ave to Jamboree	28,000	3,849	0.137	A	0	3,849	0.137	A	0.000	No
Campus Drive	West of MacArthur	54,000	33,397	0.618	B	0	33,397	0.618	B	0.000	No
	MacArthur to Von Karman	32,000	16,126	0.504	A	0	16,126	0.504	A	0.000	No
	Von Karman Ave to Teller	28,000	13,629	0.487	A	0	13,629	0.487	A	0.000	No
	Teller to Jamboree	28,000	12,797	0.457	A	30	12,827	0.458	A	0.001	No
	Jamboree to Carlson	28,000	20,808	0.743	C	0	20,808	0.743	C	0.000	No
	Carlson to University	13,000	19,664	**1.513**	**F**	0	19,664	**1.513**	**F**	0.000	No
	East of University	28,000	24,866	0.888	D	0	24,866	0.888	D	0.000	No
University Drive	MacArthur to California	32,000	27,154	0.849	D	0	27,154	0.849	D	0.000	No
	California to Mesa	32,000	32,877	**1.027**	**F**	0	32,877	**1.027**	**F**	0.000	No
	Mesa to Campus	32,000	33,397	**1.044**	**F**	0	33,397	**1.044**	**F**	0.000	No
	Campus to Harvard	54,000	28,507	0.528	A	0	28,507	0.528	A	0.000	No

Bold and shaded values indicate a deficient Level of Service, based on the City of Irvine Traffic Impact Analysis Guidelines

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TABLE 18
PEAK HOUR LINK ANALYSIS
CEQA ANALYSIS YEAR 2022 WITH PROJECT

Roadway	Segment	Direction	# Lanes	Capacity	AM Peak			PM Peak		
					Volume	V/C	LOS	Volume	V/C	LOS
Von Karman Avenue	North of Main Street	Northbound	2	3,200	1,287	0.402	A	1,626	0.508	A
		Southbound	2	3,200	1,142	0.357	A	1,276	0.399	A
	Main Street to Michelson Drive	Northbound	2	3,200	1,287	0.402	A	1,626	0.508	A
		Southbound	2	3,200	1,142	0.357	A	1,276	0.399	A
Jamboree Road	North of Main Street	Northbound	4	6,400	3,075	0.480	A	3,989	0.623	B
		Southbound	4	6,400	3,868	0.604	A	3,340	0.522	A
	Main Street to I-405 NB Ramps	Northbound	4	6,400	3,075	0.480	A	3,989	0.623	B
		Southbound	4	6,400	3,868	0.604	A	3,340	0.522	A
	I-405 NB Ramps to I-405 Southbound Ramps	Northbound	4	6,400	2,883	0.450	A	4,431	0.692	B
		Southbound	4	6,400	4,192	0.655	B	3,121	0.488	A
	I-405 SB Ramps to Michelson Drive	Northbound	4	6,400	2,583	0.404	A	4,523	0.707	C
		Southbound	4	6,400	5,604	0.876	D	3,431	0.536	A
Campus Drive	Carlson Avenue to University Drive	Eastbound	1	1,600	667	0.417	A	1,116	0.698	B
		Westbound	1	1,600	776	0.485	A	863	0.539	A
University Drive	California Avenue to Mesa Road	Eastbound	2	3,200	1,096	0.343	A	2,240	0.700	B
		Westbound	2	3,200	2,373	0.742	C	1,447	0.452	A
	Mesa Road to Campus Drive	Eastbound	2	3,200	1,096	0.343	A	2,240	0.700	B
		Westbound	2	3,200	2,373	0.742	C	1,447	0.452	A

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ANALYSIS OF STATE HIGHWAY FACILITIES

Intersections on State Highway Facilities

Intersections on State Highway facilities, which are controlled by Caltrans, are also analyzed using the Highway Capacity Manual (HCM) methodology, as required by the *Caltrans Guide for the Preparation of Traffic Impact Studies* (State of California Department of Transportation, December 2002). In the vicinity of the project, the I-405 and SR-73 freeways are Caltrans facilities. Therefore, study intersections on these roadways have also been analyzed using the HCM intersection analysis methodology.

The HCM methodology measures average seconds of delay per vehicle based on a number of technical parameters, such as peak hourly traffic volumes, number of lanes, type of signal operation, signal timing, and signal phasing in the calculations. A description of each Level of Service, based on delay parameters, per the Highway Capacity Manual (HCM) is provided in the chart on the following page.

For State-controlled intersections, Level of Service standards and impact criteria specified by Caltrans will apply. The *Caltrans Guide for the Preparation of Traffic Impact Studies* states that "Caltrans endeavors to maintain a target Level of Service at the transition between LOS C and LOS D on State highway facilities. If an existing State highway facility is operating at less than the target LOS, the existing Level of Service is to be maintained."

Traffic Impact Criteria

The *Caltrans Guide for the Preparation of Traffic Impact Studies* does not establish a threshold of significance for State Highway intersections. This traffic analysis uses the following traffic threshold of significance:

- A significant project impact occurs at a State Highway study intersection when the addition of project-generated trips causes the peak hour level of service of the study intersection to change from acceptable operation (LOS A, B, or C) to deficient operation (LOS D, E, or F).

LEVEL OF SERVICE DESCRIPTIONS		
Level of Service	**Signalized Intersection Delay (sec)**	**Description**
A	≤10	LOS A describes operations with a control delay of 10 seconds per vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	> 10 and ≤ 20	LOS B describes operations with control delay between 10 and 20 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is short. More vehicles stop than with LOS A.
C	> 20 and ≤ 35	LOS C describes operations with control delay between 20 and 35 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the progression is favorable and the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	> 35 and ≤ 55	LOS D describes operations with control delay between 35 and 55 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	> 55 and ≤ 80	LOS E describes operations with control delay between 55 and 80 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
Source: Highway Capacity Manual, 2010		

State Highway Intersection Analysis

Peak hour intersection analysis was conducted using the HCM methodology for the following State Highway study intersections:

- 11. Jamboree Road at I-405 NB Ramps
- 12. Jamboree Road at I-405 SB Ramps

Intersection analysis worksheets for all HCM analysis of State Highway intersections are provided in ***Appendix E***.

Existing Conditions

Existing peak hour intersection operations for the State Highway study intersections are summarized on **Table 19**. Each of the State Highway study intersections currently operates at an acceptable Level of Service using the HCM delay analysis methodology.

Existing Plus Project

Existing Plus Project peak hour operation for the State Highway study intersections are summarized on Table 19, previously referenced. Each of the State Highway study intersections would continue to operate at an acceptable Level of Service with the addition of project traffic.

CEQA Analysis Year 2022 Without Project

CEQA Analysis Year 2022 Without Project peak hour operation for the State Highway study intersections are summarized on Table 19, previously referenced. The intersection of Jamboree Road at the I-405 Southbound Ramps would operate at LOS E in the morning peak hour under CEQA Analysis Year 2022 Without Project conditions.

CEQA Analysis Year 2022 With Project

CEQA Analysis Year 2022 With Project peak hour operation for the State Highway study intersections are summarized on Table 19, shown previously. With the addition of project traffic, the intersection of Jamboree Road at the I-405 Southbound Ramps would continue to operate at LOS E in the AM peak hour. The project traffic would not cause the Level of Service at this intersection to worsen, and therefore would not result in a significant impact. The intersection of Jamboree Road at the I-405 Northbound Ramps would continue to operate at an acceptable Level of Service.

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TABLE 19
KOLL CENTER RESIDENCES
SUMMARY OF STATE HIGHWAY INTERSECTION OPERATIONS

	Intersection	Without Project				With Project				Project Impact			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		Change		Significant ?	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	AM	PM	AM	PM
EXISTING CONDITIONS													
11	Jamboree Rd/I-405 NB Ramps	17.0	B	10.5	B	17.5	B	11.0	B	0.5	0.5	No	No
12	Jamboree Rd/I-405 SB Ramps	24.3	C	19.6	C	29.4	C	20.3	C	5.1	0.7	No	No
CEQA ANALYSIS YEAR 2022													
11	Jamboree Rd/I-405 NB Ramps	18.9	B	12.4	B	18.9	B	12.6	B	0.0	0.2	No	No
12	Jamboree Rd/I-405 SB Ramps	**76.5**	**E**	21.2	C	**76.7**	**E**	21.2	C	0.2	0.0	No	No

Notes:
Bold and shaded values indicate intersections operating at an unacceptable Level of Service.
Intersection operation is expressed in average seconds of delay per vehicle during the peak hour using the HCM Methodology.

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CONGESTION MANAGEMENT PROGRAM COMPLIANCE

The Orange County Congestion Management Program (CMP) was established in 1991, to reduce traffic congestion and to provide a mechanism for coordinating land use and development decisions. Compliance with CMP requirements ensures a city's eligibility to compete for State gas tax funds for local transportation projects.

A copy of the County of Orange CMP Highway System is provided in ***Appendix F***. Within the project study area, the CMP Highway System includes two arterials: Jamboree Road north of MacArthur Boulevard, and MacArthur Boulevard south of Jamboree Road. CMP intersections in the vicinity of the project consist of:

- 4. MacArthur Boulevard at Jamboree Road
- 11. I-405 Northbound Ramps at Jamboree Road
- 12. I-405 Southbound Ramps at Jamboree Road

The Orange County CMP states that "a TIA will be required for CMP purposes for all proposed developments generating 2,400 or more daily trips," and that "for developments which will directly access a CMP Highway System link, the threshold for requiring a TIA should be reduced to 1,600 or more trips per day.

The project is estimated to generate approximately 1,207 daily trips. Base on CMP criteria, a separate CMP analysis is not required of the project.

SITE ACCESS AND SITE CIRCULATION

Vehicular access to Koll Center Newport is currently provided by three driveways on Birch Street, and two driveways on Von Karman Avenue. Cross access throughout the site currently allows drivers to access any parking area within Koll Center Newport from any of the site driveways. All driveways are unsignalized and gated. Drivers access the site either by a key card or by pressing the button and pulling a parking ticket. To exit the site, key card users use their card to raise the gate. Visitors must insert a validated ticket or pay at the gate in order to exit.

For discussion purposes, the driveways have been numbered 1 through 5, as shown on **Figure 17**. The following provides a brief description of each of the existing driveways.

- ***Driveway 1:*** The westernmost driveway on Birch Street is located approximately 300 feet east of Von Karman Avenue, and is a full-movement driveway. It is 30 feet wide, and provides one inbound lane and one outbound lane. The entry gate on Driveway 1 is set back approximately 95 feet from Birch Street. This driveway leads directly to a surface parking area at the north end of the Koll Center Newport site.

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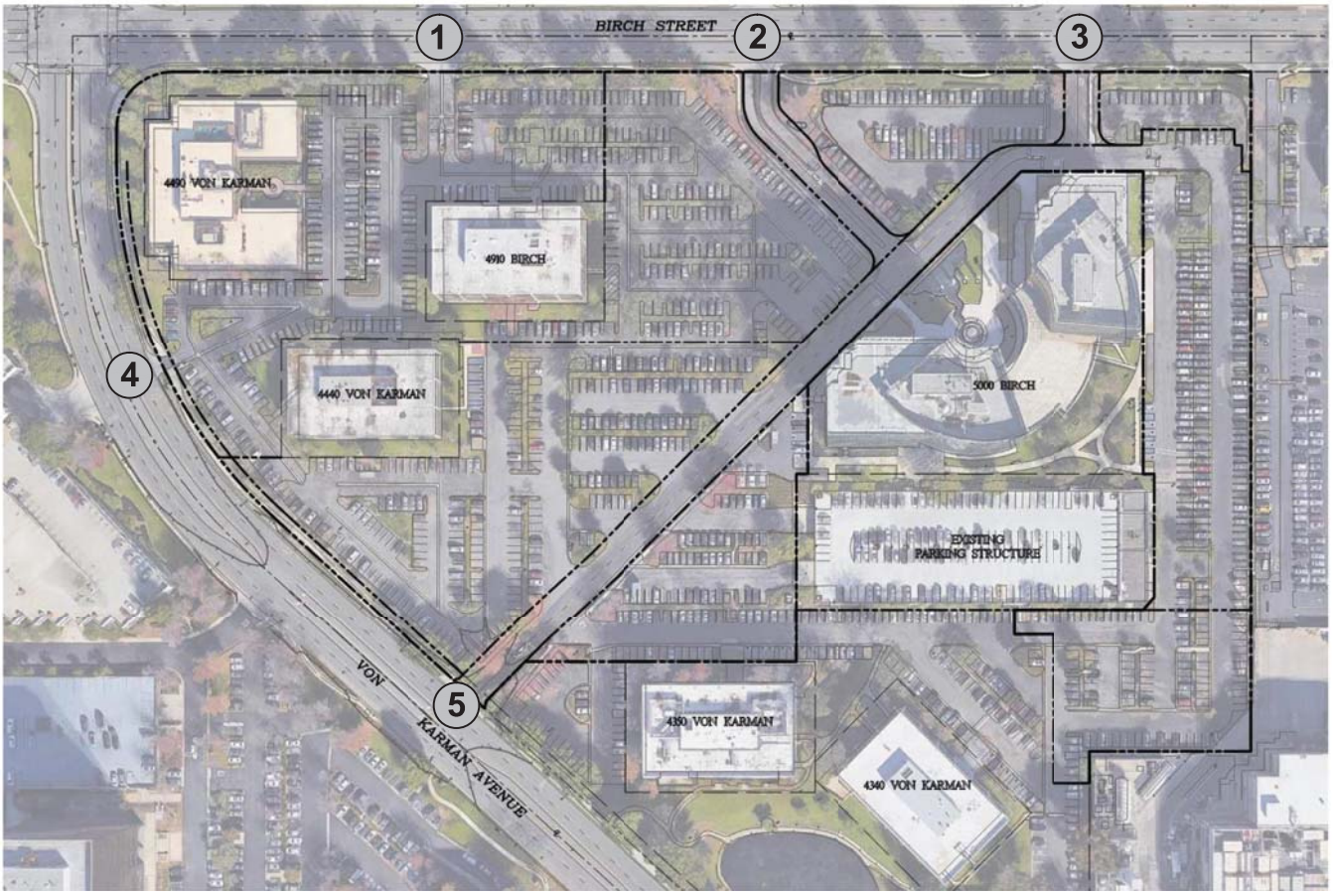

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FIGURE 17
EXISTING SITE ACCESS

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- ***Driveway 2:*** The middle driveway on Birch Street is located approximately 600 feet east of Von Karman Avenue, and is a full-movement driveway. It is 36 feet wide, and provides one inbound lane and one outbound lane, with a narrow, raised median. The entry gate is set back approximately 165 feet from Birch Street. This driveway intersects with the spine street that runs through the Koll Center Newport site and connects Von Karman Avenue and Birch Street in an east-west orientation.

- ***Driveway 3:*** The eastern driveway on Birch Street is located approximately 1,100 feet east of Von Karman Avenue and approximately 750 feet west of Jamboree Road, and is a full-movement driveway. It is 36 feet wide, and provides one inbound lane and one outbound lane. This driveway connects in a T-intersection to the spine street approximately 85 feet from Birch Street. Entry gates are located on the main spine street, approximately 50 feet to the west, and approximately 100 feet to the east of the T-intersection.

- ***Driveway 4:*** The northern driveway on Von Karman Avenue is located approximately 350 feet south of Birch Street, and is an exit-only driveway. It is approximately 15 feet wide, and provides one outbound lane only, from which drivers can make both right and left turns.

- ***Driveway 5:*** The southern driveway on Von Karman Avenue is located approximately 900 feet south of Birch Street, and is a full-movement driveway. It is 36 feet wide, and provides one inbound and one outbound lane. The entry gate is set back approximately 90 feet from Von Karman Avenue. This driveway is the western end of the spine street that connects Von Karman Avenue and Birch Street in an east-west orientation.

The proposed project access plan is provided on **Figure 18**. As part of the Koll Center Residences project, the five existing site driveways for Koll Center Newport will remain in their current locations, with a number of changes to the access provisions for the site, as follows:

- The most significant change to the site access circulation is that the main drive aisle that runs from Von Karman Avenue to Birch Street will become an open-access internal spine street through the site. All gates to the Koll Center Newport parking areas and to the new residential buildings will be located off the spine street.

- When Phase 1 is complete, all parking for the Phase 1 residential units will be provided in the Phase 1 parking structure. In addition, 276 spaces in the Phase A parking structure will be designated as office parking for Koll Center Newport.

- Access to the residential parking in the Phase 1 parking structure will be via a gated entrance off Driveway 2, which will be accessible from Driveways 2, 3, and 5.

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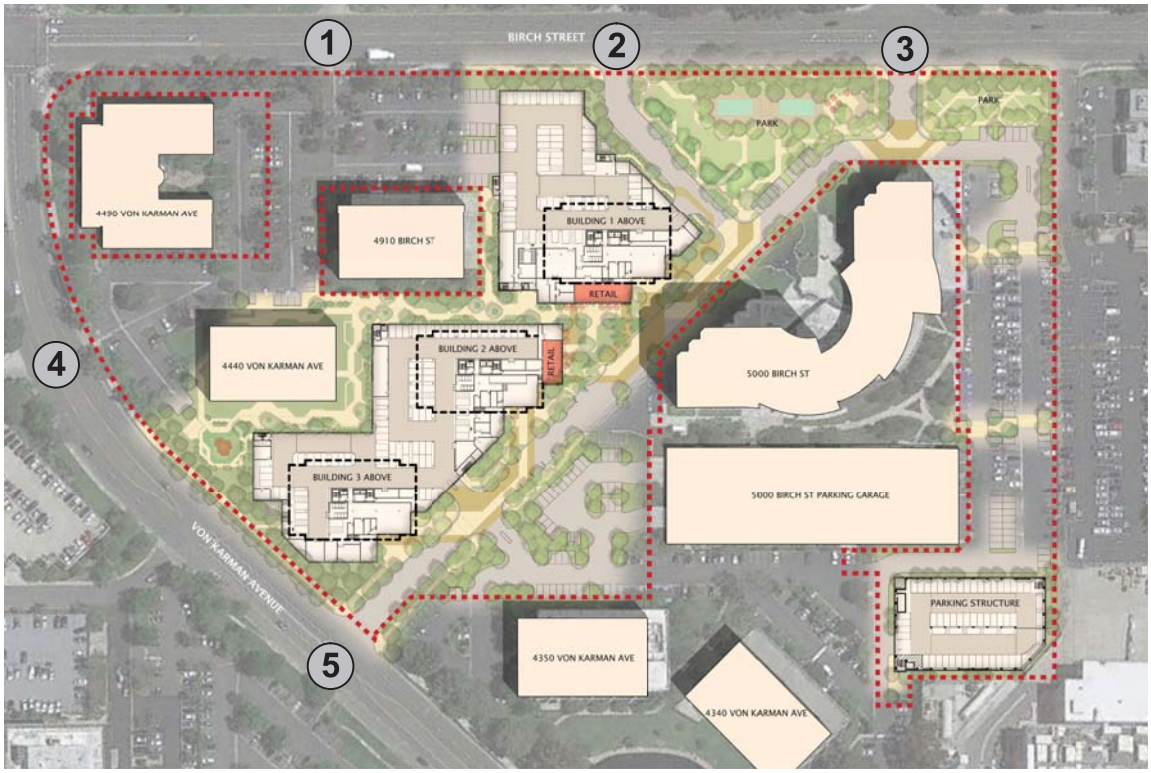

FIGURE 18
PROPOSED SITE ACCESS

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- Access to the residential parking in the Phase 2 parking structure will be via a gated entrance directly off the spine street, which will be accessible from Driveways 2, 3, and 5.

- ***Driveway 1:*** No changes are proposed for Driveway 1 itself. Access to the office portion of the Phase 1 parking structure will be provided from the surface parking area directly east of Driveway 1. With the construction of the project, drivers entering Driveway 1 will have access only to the surface parking areas immediately accessed by Driveway 1, and the office portion of the Phase 1 parking structure; they will not be able to get to the center drive aisle or to the rest of the Koll Center Newport site from Driveway 1.

- ***Driveway 2:*** The entry gate on Driveway 2 will be removed. A gated entry to the residential portion of the Phase 1 parking structure will be provided off Driveway 2. Drivers entering Driveway 2 will be able to access all parking areas of Koll Center Newport, except the surface parking areas immediately accessed by Driveway 1, and the office portion of the Phase 1 parking structure. Driveway 2 will be reconfigured to provide one inbound lane and two outbound lanes, with one left-turn and one right-turn lane.

- ***Driveway 3:*** The Koll Center Newport entry gates on the main drive aisle on either side of Driveway 3 will be removed. A new office parking gate for the parking areas to the east of the driveway will be provided approximately 80 feet to the southeast. Drivers entering Driveway 3 will be able to access all parking areas of Koll Center Newport, except the surface parking areas immediately accessed by Driveway 1, and the office portion of the Phase 1 parking structure.

- ***Driveway 4:*** Driveway 4 will remain an exit-only driveway, and will be accessible only from the surface parking areas immediately accessed by Driveway 1. Outbound movements will be restricted to right turns only.

- ***Driveway 5:*** The entry gate on Driveway 5 will be removed. A new office parking gate for the parking areas to the east of the driveway will be provided on the first intersecting drive aisle. Driveway 5 will be reconfigured to provide one inbound lane and two outbound lanes, with one left-turn and one right-turn lane.

CONSTRUCTION TRAFFIC

Construction of the Koll Center Residences project would add construction-related trips to and from the site during each of the construction phases. These trips are associated with construction activities, including construction workers, grading, and construction of structures and site features.

Large construction equipment such as bulldozers, loaders, scrapers, and pavers would be required during various construction phases. Large equipment is generally brought to the site at the start of the construction phase and kept on site until its term of use ends. A staging area would be designated on-site to store construction equipment and supplies during construction.

Throughout construction, the size of the work crew reporting to the site each day would vary depending on the construction phase and the different activities taking place at the time. Parking for workers would be provided on-site during all phases of construction. Construction workers will not be allowed to park on local streets. If needed during the peak construction periods, off-site parking will be provided, and workers will carpool or be shuttled to the worksite.

The Applicant will be required to prepare a construction management plan to identify the timing of construction activities, and the movement of construction vehicles. There will be no dirt hauling activities allowed to and from the site during the peak hours during any of the construction phases.

Construction Phasing

Phase A – Parking Structure

To construct the Phase A parking structure, it is estimated that approximately 24,139 cubic yards of cut material would be exported from the site. Assuming a capacity of 16 cubic yards per truckload, grading activities will require removal of approximately 1,509 truckloads of cut material. Assuming a 40-day period for excavation and construction, this would equate to an average of 38 truckloads of export cut material, for a total of 38 trucks inbound to and outbound from the site per day.

It is estimated that there will be an average of 15 workers per day at the job site during construction of the site work and parking structure, for an additional 30 construction worker trips per day for the parking structure construction. Heavy vehicle types will include excavator, tractor, loader, water truck, concrete pump truck, crew truck, backhoe, and a 10-wheeler dump truck.

Phase 1 – Building 1

To construct the Phase 1 building, it is estimated that approximately 44,000 cubic yards of cut material would be exported from the site. Assuming a capacity of 16 cubic yards per truckload, grading activities will require removal of approximately 2,750 truckloads of cut material. Assuming a 60-day period for excavation and construction, this would equate to an average of 46 truckloads of export cut material, for a total of 46 trucks inbound to and outbound from the site per day.

It is estimated that there will be an average of 40 workers at the job site per day during construction of the site work and Building 1. During construction of the superstructure and the interiors, there will be an average of 80-90 workers on site. This would equate to 80 to 180 construction worker trips per day for construction of the Phase 1 parking structure and superstructure. Heavy vehicle types will include excavator, tractor, loader, water truck, concrete pump truck, crew truck, backhoe, 10-wheeler dump truck, drill rigs, and skid steer loaders.

Phase 2 – Building 2 and Building 3

To construct Building 2 and Building 3, it is estimated that approximately 54,000 cubic yards of cut material would be exported from the site. Assuming a capacity of 16 cubic yards per truckload, grading activities will require removal of approximately 3,375 truckloads of cut material. Assuming a 60-day period for excavation and construction, this would equate to an average of 56 truckloads of export cut material, for a total of 56 trucks inbound to and outbound from the site per day.

It is estimated that there will be an average of 40 workers daily at the job site during construction of the site work and parking structure. During construction of the superstructure and the interiors, there will be an average of 80-90 workers on site. This would equate to 80 to 180 construction worker trips per day for construction of the Phase 2 parking structure and superstructure. Heavy vehicle types will include excavator, tractor, loader, water truck, concrete pump truck, crew truck, backhoe, 10-wheeler dump truck, drill rigs, and skid steer loaders.

Construction Traffic Management

Heavy vehicles associated with construction of the project would use the existing regional and local truck route network to approach the site, getting as close to the destination site as possible before turning off the designated truck route. Impacts from construction traffic would be occasional and temporary delays to traffic, during the movement of heavy equipment or transport of heavy loads to and from the site.

The Applicant will be required to provide a construction management plan, and to identify planned travel patterns for haul vehicles, and obtain a Haul Route permit from the City. Approach and departure routes for construction vehicles will be via Jamboree Road, MacArthur Boulevard, Von Karman Avenue and Birch Street. Depending on the origin/destination (the nearest landfill, or the deposit site identified for cut material), trucks will either arrive and depart via the I-405 Freeway, to the north of the site; or via the SR-73 Freeway, to the south of the site.

SUMMARY OF FINDINGS AND CONCLUSIONS

- The proposed Koll Center Residences site is located at the southeast corner of Birch Street and Von Karman Avenue in the Airport Area of the City of Newport Beach.

- The Koll Center Residences project would consist of 260 luxury condominium units and 3,000 square feet of retail development within the existing surface parking for the Koll Center Newport office development.

- Twenty-nine (29) intersections were analyzed for potential traffic impacts. All signalized intersections were analyzed using the Intersection Capacity Utilization (ICU) methodology. One unsignalized intersection was analyzed using the Highway Capacity Manual (HCM) methodology. In addition, two intersections on State highway facilities were analyzed using the HCM methodology to comply with Caltrans requirements.

- Under Existing Conditions, all study intersections currently operate at acceptable levels of service.

- Under Existing Plus Project Conditions, all study intersections would continue to operate at acceptable levels of service.

- Under TPO Analysis Year 2022 Without Project conditions, the following intersections would operate at an unacceptable Level of Service:
    - 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
    - 13. Jamboree Road at Michelson Drive (PM: LOS F)

- Under TPO Analysis Year 2022 With Project conditions, these two intersections would continue to operate at an unacceptable Level of Service. The addition of project traffic would not cause additional intersections to operate at an unacceptable Level of Service, and the project would not result in a significant impact at any study intersection.

- Under CEQA Analysis Year 2022 Without Project conditions, the following intersections would operate at an unacceptable Level of Service:
    - 12. Jamboree Road at I-405 SB Ramps (AM: LOS F, PM: LOS F)
    - 13. Jamboree Road at Michelson Drive (PM: LOS F)

- Under CEQA Analysis Year 2022 With Project conditions, these two intersections would continue to operate at an unacceptable Level of Service. The addition of project traffic would not cause additional intersections to operate at an unacceptable Level of Service, and the project would not result in a significant impact at any study intersection.

- A separate analysis of 46 roadway segments within the City of Irvine was conducted per City of Irvine guidelines. Several roadway segments operate deficiently under existing and future conditions on a daily basis. In accordance with City of Irvine policy, a Peak Hour Link Analysis (PHLA) was conducted for these roadway segments. Each roadway segment was found to operate at an acceptable Level of Service from a peak hour perspective.

- A separate analysis of intersections on State Highways was conducted in accordance with Caltrans requirements. Intersection analysis was conducted using the Highway Capacity Manual (HCM) methodology, in accordance with the *Caltrans Guide for the Preparation of Traffic Impact Studies.*

- Based on the HCM intersection methodology, the addition of project-related traffic to State Highway intersections would not cause any intersection to operate at LOS D or worse, and would not cause the Level of Service to worsen at any intersection already operating at LOS D or worse.

- The project is estimated to generate approximately 1,207 daily trips. The addition of project traffic will not cause a significant impact at the CMP intersections.

- As part of the Koll Center Residences project, the five existing site driveways for Koll Center Newport will remain in their current locations, with a number of changes to the access provisions for the site.

- The main drive aisle that runs from Von Karman Avenue to Birch Street will become an open-access spine street through the site. All gates to the Koll Center Newport parking areas and to the new residential buildings will be located off the main drive aisle.

- Access to the residential parking in the Phase 1 parking structure will be via a gated entrance off Driveway 2, which will be accessible from Driveways 2, 3, and 5. Access to the residential parking in the Phase 2 parking structure will be via a gated entrance directly off the main drive aisle, which will be accessible from Driveways 2, 3, and 5.

- Impacts from construction traffic would be occasional and temporary delays to traffic, during the movement of heavy equipment or transport of heavy loads to and from the site.

- The project will be required to submit a construction management plan, which will include the proposed haul route plan for construction traffic, for approval by the City. The construction crew will be required to comply with construction management requirements, such as complying with peak hour restrictions, using flag men for short-term obstructions, and a formal traffic control plan for extended lane and street closures. There will be no dirt hauling activities allowed to and from the site during the peak hours.