Temescal Valley Business Park (PAR190052)

TRAFFIC ANALYSIS
COUNTY OF RIVERSIDE

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13627-11 TA Report

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
HOV	High-Occupancy Vehicle
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PCE	Passenger Car Equivalents
PeMS	Performance Measurement System
PHF	Peak Hour Factor
Project	Temescal Valley Business Park
RCTC	Riverside County Transportation Commission
RivTAM	Riverside County Transportation Analysis Model
RTA	Riverside Transit Authority
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SHS	State Highway System
TCR	Transportation Concept Report
TA	Traffic Analysis
TUMF	Transportation Uniform Mitigation Fee
WRCOG	Western Riverside Council of Governments
V/C	Volume to Capacity

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1 INTRODUCTION

This report presents the results of the traffic analysis (TA) for the proposed Temescal Valley Business Park development ("Project"), which is located south of Dawson Canyon Road and east of Temescal Canyon Road, as shown on Exhibit 1-1.

The purpose of this TA is to evaluate the potential deficiencies related to traffic and circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to resolve identified deficiencies and to achieve acceptable circulation system operational conditions. This traffic study has been prepared in accordance with the County of Riverside's Traffic Impact Analysis Preparation Guide (August 2008), the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies, and through consultation with County of Riverside staff during the scoping process. (1) (2) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TA.

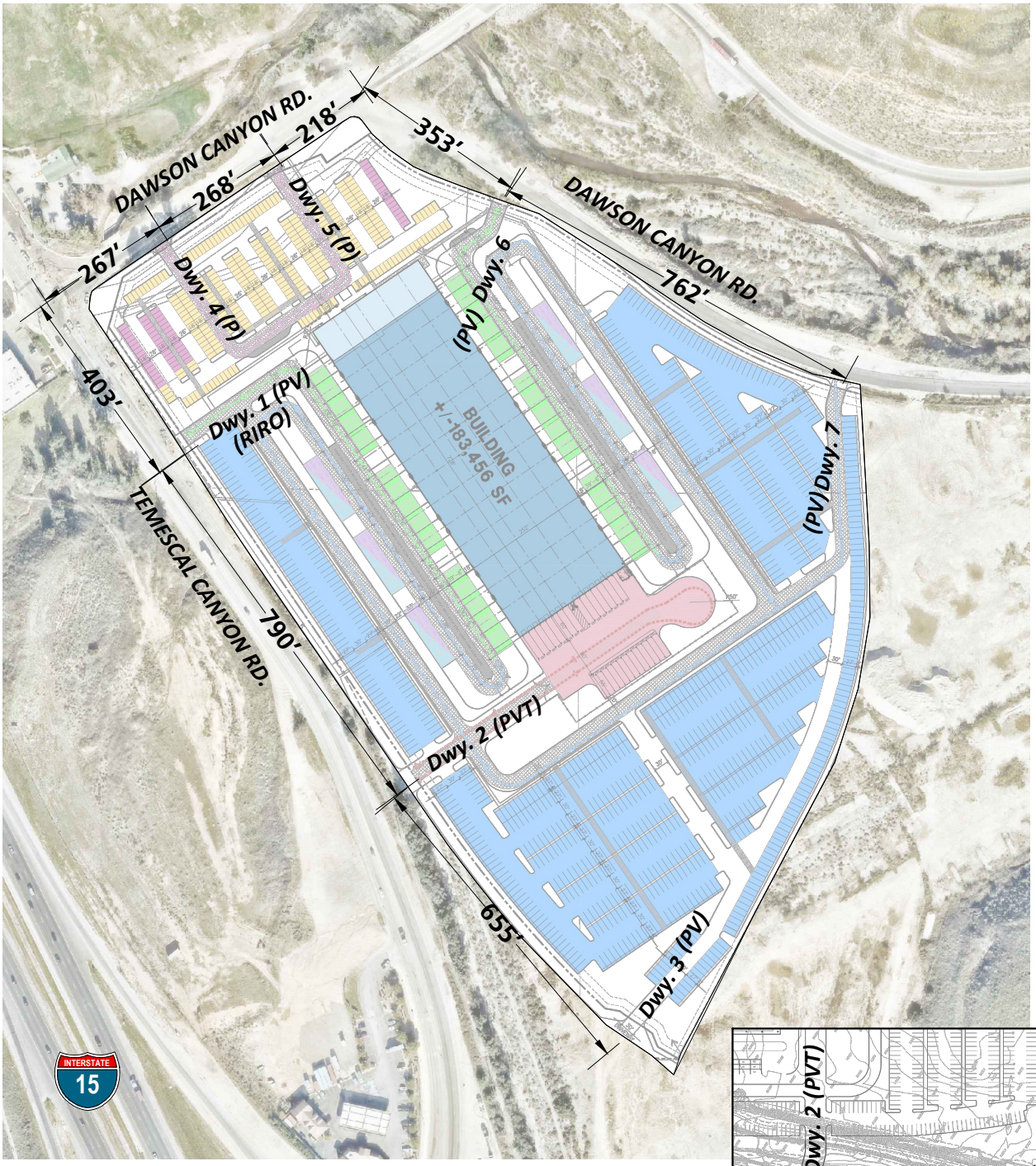
1.1 SUMMARY OF FINDINGS

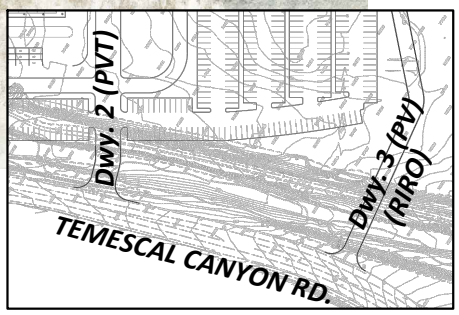
The Project is proposing to construct the following improvements as design features in conjunction with development of the site:

- Project to construct Temescal Canyon Road from Dawson Canyon Road to the Project's southern boundary at its ultimate half-section width as an Arterial Highway (128-foot right-of-way) in compliance with the circulation recommendations found in the County of Riverside General Plan Circulation Element. The Project will construct Temescal Canyon Road to align with the future extension of Temescal Canyon Road that is proposed to run along the northeast side of the I-15 Freeway. Driveway 3 of the proposed Project will align with the existing Temescal Canyon Road. The Project's Civil Engineer is preparing an alignment study which will identify the placement and lane geometrics of the realigned intersection of Temescal Canyon Road North and Temescal Canyon Road (existing).
- Project to construct Dawson Canyon Road, from Temescal Canyon Road to the Project's northeastern boundary at its ultimate half-section width as an Industrial Collector (78-foot right-of-way) in compliance with the circulation recommendations found in the County of Riverside General Plan Circulation Element.
- Project to install traffic signals along Temescal Canyon Road at Driveway 2 and Driveway 3 (future Temescal Canyon Road North and Temescal Canyon Road intersection).

Additional details and intersection lane geometrics are provided in Section 1.6 *Recommendations* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN





EXISTING TEMESCAL CANYON ROAD ALIGNMENT

LEGEND:

RIRO	= RIGHT-IN/RIGHT-OUT ONLY ACCESS
P	= PASSENGER CARS ONLY
PV	= PASSENGER CARS AND VANS
PVT	= PASSENGER CARS, VANS AND TRUCKS

N

NOTE: UNLESS NOTED, ALL DRIVEWAYS ARE ASSUMED TO BE FULL ACCESS.

1.2 PROJECT OVERVIEW

The Project is proposed to consist of the development of a 183,456 square foot warehouse. The anticipated Project opening year is 2022. Vehicular access (both passenger cars and delivery vans) and truck access will be provided via the following driveways (see Exhibit 1-1):

- Temescal Canyon Road via Driveway 1 – right-in/right out for passenger cars and vans
- Temescal Canyon Road via Driveway 2 – full access for passenger cars, vans, and trucks
- Temescal Canyon Road via Driveway 3 – full access for passenger cars and vans
- Dawson Canyon Road via Driveway 4 – full access for passenger cars
- Dawson Canyon Road via Driveway 5 – full access for passenger cars
- Dawson Canyon Road via Driveway 6 – full access for passenger cars and vans
- Dawson Canyon Road via Driveway 7 – full access for passenger cars and vans

Pursuant to discussions with the County of Riverside, for Without Temescal Canyon Road Extension conditions, an alternative has been evaluated for Driveways 2 and 3 at Temescal Canyon Road that evaluates the existing alignment of Temescal Canyon Road, as shown on Exhibit 1-1. Based on the existing alignment, the following alternative access is assumed:

- Temescal Canyon Road via Driveway 2 – full access for passenger cars, vans, and trucks
- Temescal Canyon Road via Driveway 3 – right-in/right- for passenger cars and vans

It should be noted, Driveway 2 is assumed to line up with the existing gas station across the street, and as such has been assumed to allow for full access.

Regional access to the Project site is available from the I-15 Freeway via Temescal Canyon Road and Weirick Road. In order to develop the traffic characteristics of the proposed project, trip-generation information has been provided by the proposed tenant based on the anticipated operations of the facility. The proposed tenant/operator currently has many other similar facilities operating throughout the United States. Based on discussions with the County, 85 percent of the peak seasonal data is utilized for the purposes of this TA in an effort to conduct a conservative analysis (as opposed to using the typical operations). The peak season is anticipated to occur over a 6-week period in a calendar year, specifically during the period between Thanksgiving and Christmas. The proposed Project (85% of the peak season) is anticipated to generate a total of 3,016 actual vehicle trip-ends per day with 205 AM peak hour trips and 388 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential deficiencies to traffic and circulation have been assessed for each of the following conditions:

- Existing (2020)
- Existing Plus Ambient Growth Plus Project (EAP) (2022) Without Temescal Canyon Road Extension
- Existing Plus Ambient Growth Plus Project (EAP) (2022) With Temescal Canyon Road Extension
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2022) Without Temescal Canyon Road Extension
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2022) With Temescal Canyon Road Extension
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

1.3.1 EXISTING (2020) CONDITIONS

Information for Existing (2020) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared. Traffic counts were conducted in November 2019 based on vehicle classification and were converted to passenger car equivalent (PCE). A 2% growth rate has been applied to reflect 2020 conditions. Use of PCE here accounts for the effects of large trucks present within the existing study area. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles.

1.3.3 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (2022) CONDITIONS

The EAP (2022) conditions analysis determines the potential circulation system deficiencies based on a comparison of the EAP traffic conditions to Existing conditions. To account for background traffic growth, an ambient growth factor from Existing (2020) conditions of 4.04% (2 percent per year, compounded over 2 years) is included for EAP (2022) traffic conditions. The assumed ambient growth factor is based on the requirements per the County of Riverside traffic study guidelines. Consistent with Riverside County traffic study guidelines, the EAP analysis is intended to identify "Opening Year" deficiencies associated with the development of the proposed Project based on the expected background growth within the study area.

The Serrano Specific Plan is located to the southeast of the proposed Project and lies adjacent to the future proposed extension of Temescal Canyon Road North along the northeast side of the I-15 Freeway. If an implementing project is processed within the Specific Plan, it is likely the future Temescal Canyon Road extension would be constructed. However, the timing of an implementing project within the Specific Plan is currently unclear. As such, EAP (2022) traffic conditions has been evaluated under both "Without Temescal Canyon Road Extension" and "With Temescal Canyon Road Extension" conditions, in the event that the Serrano Specific Plan does or does not submit an implementing project before the proposed Project is built and

operational. Project access at Driveways 2 and 3 have also been evaluated both without and with the realignment of Temescal Canyon Road in the event that the Project is unable to realign the street along its frontage by opening day.

1.3.4 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2022) CONDITIONS

The EAPC (2022) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, an ambient growth factor of 6.12% from Existing conditions are included for EAPC traffic conditions (2 percent per year, compounded over 3 years).

Conservatively, the TA estimates the area ambient traffic growth and then adds traffic generated by other known or probable related projects. These related projects are at least in part already accounted for in the assumed 4.04% of ambient growth; and some of these related projects would likely not be implemented and operational within the 2022 Opening Year time frame assumed for the Project. The resulting traffic growth utilized in the TA (4.04% ambient growth factor plus traffic generated by related projects) would therefore tend to overstate rather than understate background cumulative traffic deficiencies under 2022 conditions.

The Serrano Specific Plan is located to the southeast of the proposed Project and lies adjacent to the future proposed extension of Temescal Canyon Road North along the northeast side of the I-15 Freeway. If an implementing project is processed within the Specific Plan, it is likely the future Temescal Canyon Road extension would be constructed. However, the timing of an implementing project within the Specific Plan is currently unclear. As such, EAPC (2022) traffic conditions has been evaluated under both "Without Temescal Canyon Road Extension" and "With Temescal Canyon Road Extension" conditions, in the event that the Serrano Specific Plan does or does not submit an implementing project before the proposed Project is built and operational.

1.3.5 HORIZON YEAR (2040) CONDITIONS

Traffic projections for Horizon Year (2040) conditions were derived from the County of Riverside Transportation Analysis Model (RivTAM) using accepted procedures for model forecast refinement and smoothing. This scenario evaluates the circulation network in order to compare the findings between the County's currently adopted General Plan, which includes the future Temescal Canyon Road extension, and the proposed circulation network modifications proposed by the Project. The Horizon Year conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) and Development Impact Fee (DIF) programs, can accommodate the long-range cumulative traffic at the target level of service (LOS) identified in the County of Riverside (lead agency) General Plan. (3) Each of these regional transportation fee programs are discussed in more detail in Section 9 *Local and Regional Funding Mechanisms*.

1.4 STUDY AREA

To ensure that this TA satisfies the County of Riverside's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by County of Riverside staff prior to the preparation of this report. The Project traffic study scoping agreement is provided in Appendix 1.1.

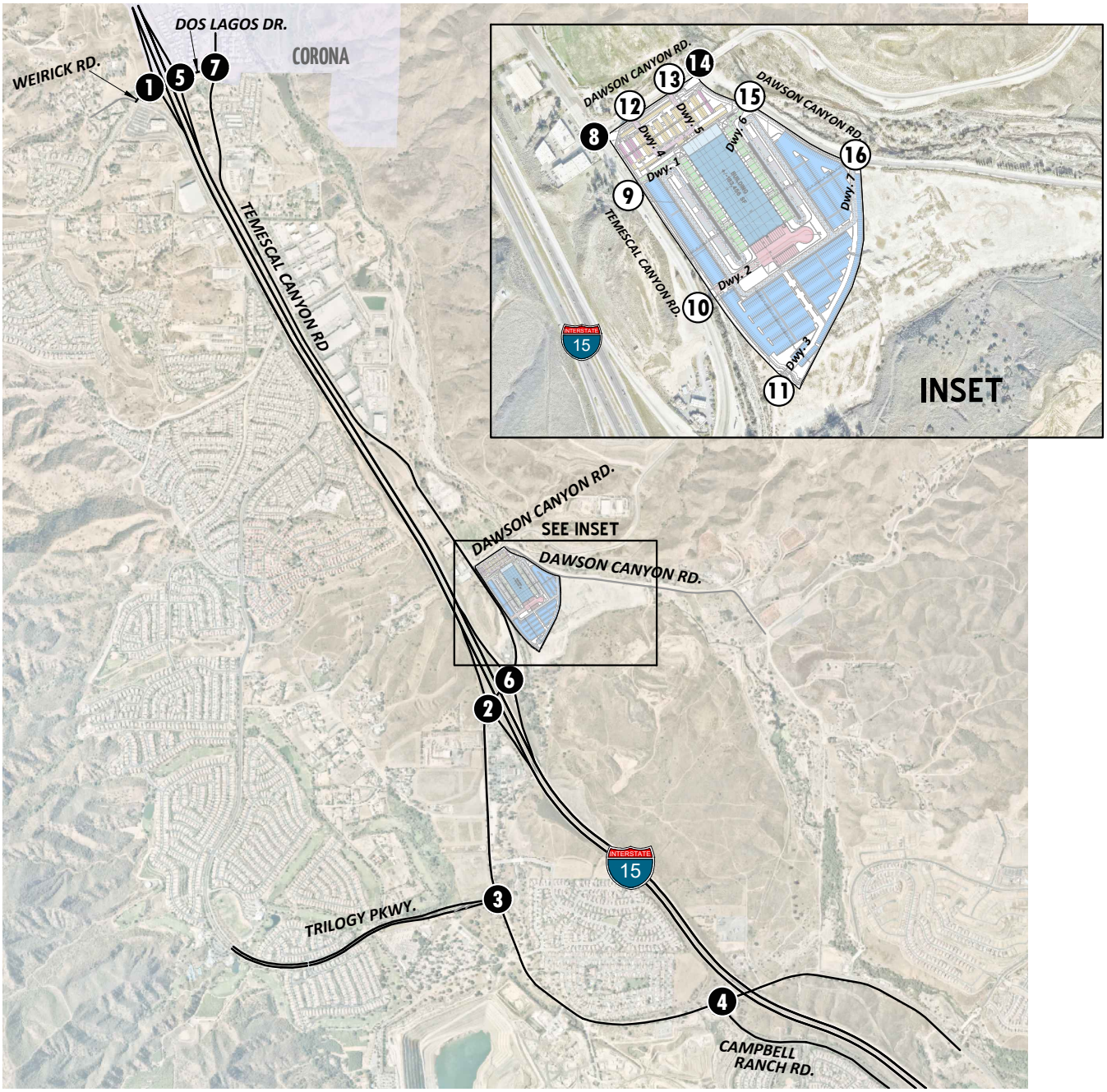
1.4.1 STUDY AREA INTERSECTIONS

The 16 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for evaluation in this TA based on consultation with County of Riverside staff. The study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the County of Riverside's traffic study guidelines. (1) The "50 peak hour trip" criteria represents a minimum number of trips at which a typical intersection would have the potential to be substantively affected by a given development proposal. The 50 peak hour trip criterion is a traffic engineering rule of thumb that is accepted and widely used within Riverside County for estimating a potential area of influence (i.e., study area).

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	I-15 SB Ramps & Weirick Rd.	County of Riverside, Caltrans	No
2	I-15 SB Ramps & Temescal Canyon Rd.	County of Riverside, Caltrans	No
3	Temescal Canyon Rd. & Trilogy Pkwy.	County of Riverside	No
4	Campbell Ranch Rd. & Temescal Canyon Rd.	County of Riverside	No
5	I-15 NB Ramps & Weirick Rd.	County of Riverside, Corona, Caltrans	No
6	I-15 NB Ramps & Temescal Canyon Rd.	County of Riverside, Caltrans	No
7	Temescal Canyon Rd. & Dos Lagos Dr.	County of Riverside, Corona	No
8	Temescal Canyon Rd. & Dawson Canyon Rd.	County of Riverside	No
9	Temescal Canyon Rd. & Driveway 1 – Future Intersection	County of Riverside	No
10	Temescal Canyon Rd. & Driveway 2 – Future Intersection	County of Riverside	No
11	Temescal Canyon Rd. & Driveway 3 – Future Intersection	County of Riverside	No
12	Driveway 4 & Dawson Canyon Rd. – Future Intersection	County of Riverside	No
13	Driveway 5 & Dawson Canyon Rd. – Future Intersection	County of Riverside	No
14	Dawson Canyon Rd. & Dawson Canyon Rd.	County of Riverside	No
15	Dawson Canyon Rd. & Driveway 6 – Future Intersection	County of Riverside	No
16	Dawson Canyon Rd. & Driveway 7 – Future Intersection	County of Riverside	No

EXHIBIT 1-2: LOCATION MAP



LEGEND:

- 0 = EXISTING INTERSECTION ANALYSIS LOCATION
- 0 = FUTURE INTERSECTION ANALYSIS LOCATION

N

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. The County of Riverside CMP became effective with the passage of Proposition 111 in 1990 and updated most recently updated in 2011. The Riverside County Transportation Commission (RCTC) adopted the 2011 CMP for the County of Riverside in December 2011. (4) CMP intersections are identified in Table 1-1. There are no study area intersections identified as a Riverside County CMP facility.

1.4.2 FREEWAY MAINLINE AND RAMP JUNCTION ANALYSIS

Study area freeway mainline analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (2) Consistent with recent Caltrans guidance, and because deficiencies to freeway segments tend to dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry typically is not required. This study evaluates the following freeway facilities adjacent to the point of entry to the SHS at the I-15 Freeway and Weirick Road and Temescal Canyon Road (see Table 1-3):

TABLE 1-2: FREEWAY FACILITY ANALYSIS LOCATIONS

ID	Freeway Facilities
1	I-15 Freeway Southbound, North of Weirick Rd.
2	I-15 Freeway Southbound, Off-Ramp at Weirick Rd.
3	I-15 Freeway Southbound, On-Ramp at Weirick Rd.
4	I-15 Freeway Southbound, Between Weirick Rd. and Temescal Canyon Rd.
5	I-15 Freeway Southbound, Off-Ramp at Temescal Canyon Rd.
6	I-15 Freeway Southbound, On-Ramp at Temescal Canyon Rd.
7	I-15 Freeway Northbound, South of Temescal Canyon Rd.
8	I-15 Freeway Northbound, North of Weirick Rd.
9	I-15 Freeway Northbound, On-Ramp at Weirick Rd.
10	I-15 Freeway Northbound, Off-Ramp at Weirick Rd.
11	I-15 Freeway Northbound, Between Weirick Rd. and Temescal Canyon Rd.
12	I-15 Freeway Northbound, On-Ramp at Temescal Canyon Rd.
13	I-15 Freeway Northbound, Off-Ramp at Temescal Canyon Rd.
14	I-15 Freeway Northbound, South of Temescal Canyon Rd.

1.5 DEFICIENCIES

This section provides a summary of deficiencies by analysis scenario. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 5 *EAP (2022) Traffic Conditions*, Section 6 *EAPC (2022) Traffic Conditions*, and Section 7 *Horizon Year (2040) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented on Exhibit 1-3.

1.5.1 EAP (2022) CONDITIONS

Intersections

All of the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hour for Without and With Temescal Canyon Road Extension, consistent with Existing (2020) traffic conditions. Project Driveways 2 and 3 on Temescal Canyon Road are also anticipated to operate at an acceptable LOS during the peak hours with the existing alignment of Temescal Canyon Road alternative.

Off-Ramp Queues

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows, consistent with Existing (2020) traffic conditions.

Freeway Facilities

Consistent with Existing (2020) traffic conditions, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for EAP (2022) traffic conditions.

1.5.2 EAPC (2022) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at a deficient LOS (i.e., LOS E or worse) during one or both peak hours for EAPC (2022) Without Temescal Canyon Road Extension traffic conditions:

- I-15 Southbound Ramps & Temescal Canyon Road (#2) – LOS F AM and PM peak hours
- Temescal Canyon Road & Trilogy Parkway (#3) – LOS F AM peak hour only
- Campbell Ranch Road & Temescal Canyon Road (#4) – LOS F AM peak hour only
- I-15 Northbound Ramps & Temescal Canyon Road (#6) – LOS F AM and PM peak hours
- Temescal Canyon Road & Temescal Canyon Road/Driveway 3 (#11) – LOS F AM and PM peak hours

Project Driveways 2 and 3 on Temescal Canyon Road are anticipated to operate at an acceptable LOS during the peak hours with both the existing alignment and realignment of Temescal Canyon Road.

EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2020)	EAP (2022) Without Temescal Canyon Extension	EAP (2022) With Temescal Canyon Extension	EAPC (2022) Without Temescal Canyon Extension	EAPC (2022) With Temescal Canyon Extension	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
1	I-15 SB Ramps & Weirick Rd.	🟢	🟢	🟢	🟢	🟢	🟢	🟢
2	I-15 SB Ramps & Temescal Canyon Rd.	🟢	🟢	🟢	🔴	🔴	🔴	🔴
3	Temescal Canyon Rd. & Trilogy Pkwy.	🟢	🟢	🟢	🔴	🟢	🟢	🟢
4	Campbell Ranch Rd. & Temescal Canyon Rd.	🟢	🟢	🟢	🔴	🟢	🟢	🟢
5	I-15 NB Ramps & Weirick Rd.	🟢	🟢	🟢	🟢	🟢	🟢	🟢
6	I-15 NB Ramps & Temescal Canyon Rd.	🟢	🟢	🟢	🔴	🔴	🔴	🔴
7	Temescal Canyon Rd. & Dos Lagos Dr.	🟢	🟢	🟢	🟢	🟢	🟢	🟢
8	Temescal Canyon Rd. & Dawson Canyon Rd.	🟢	🟢	🟢	🟢	🟢	🟢	🟢
9	Temescal Canyon Rd. & Dwy. 1	NA	🟢	🟢	🟢	🟢	NA	🟢
10	Temescal Canyon Rd. & Dwy. 2	NA	🟢	🟢	🟢	🟢	NA	🟢
	With Existing Alignment	NA	🟢	NA	🟢	NA	NA	NA
11	Temescal Canyon Rd. & Dwy. 3	NA	🟢	🟢	🔴	🔴	🔴	🔴
	With Existing Alignment	NA	🟢	NA	🟢	NA	NA	NA
12	Dwy. 4 & Dawson Canyon Rd.	NA	🟢	🟢	🟢	🟢	NA	🟢
13	Dwy. 5 & Dawson Canyon Rd.	NA	🟢	🟢	🟢	🟢	NA	🟢
14	Dawson Canyon Rd. & Dawson Canyon Rd.	🟢	🟢	🟢	🟢	🟢	🟢	🟢
15	Dawson Canyon Rd. & Dwy. 6	NA	🟢	🟢	🟢	🟢	NA	🟢
16	Dawson Canyon Rd. & Dwy. 7	NA	🟢	🟢	🟢	🟢	NA	🟢

LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- 🟢 = LOS A-D
- 🟡 = LOS E
- 🔴 = LOS F
- NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

With the future extension of Temescal Canyon Road, there are no additional study area intersections anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours under EAPC (2022) With Temescal Canyon Road Extension. The intersections of Temescal Canyon Road & Trilogy Parkway (#3) and Campbell Ranch Road & Temescal Canyon Road (#4) are anticipated to operate at an acceptable LOS with the future extension of Temescal Canyon Road. This is due to the shift in travel patterns as the future extension of Temescal Canyon Road provides an alternative northbound and southbound route (i.e., reductions in traffic along the existing Temescal Canyon Road with the new extension in place).

Off-Ramp Queues

The following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2022) Without Temescal Canyon Road Extension traffic conditions:

- I-15 SB Ramps & Temescal Canyon Road (#2) SBR – PM peak hour only
- I-15 NB Ramps & Temescal Canyon Road (#6) NBL/T/R – AM peak hour only

With the future extension of Temescal Canyon Road, there are no additional movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2022) With Temescal Canyon Road Extension traffic conditions.

Freeway Facilities

The study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for EAPC (2022) traffic conditions, with the exception of the following freeway segment:

- I-15 Freeway Southbound, North of Weirick Road (#1) – LOS E PM peak hour only

1.6.4 HORIZON YEAR (2040) CONDITIONS

Intersections

The following study area intersections are anticipated to operate at a deficient LOS (i.e., LOS E or worse) during one or both peak hours under Horizon Year (2040) Without Project traffic conditions:

- I-15 SB Ramps & Temescal Canyon Road (#2) – LOS F AM and PM peak hours
- I-15 NB Ramps & Temescal Canyon Road (#6) – LOS F AM and PM peak hours
- Temescal Canyon Road & Temescal Canyon Road/Driveway 3 (#11) – LOS F AM and PM peak hours

With the addition of Project traffic, there are no additional intersections anticipated to result in an unacceptable LOS in addition to the intersections previously identified under Horizon Year (2040) Without Project traffic conditions.

Off-Ramp Queues

The following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) Without Project traffic conditions:

- I-15 SB Ramps & Temescal Canyon Road (#2) SBR – AM and PM peak hours
- I-15 NB Ramps & Temescal Canyon Road (#6) NBL/T/R – AM peak hour only

With the addition of Project traffic, there are no additional movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) With Project traffic conditions.

Freeway Facilities

The study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Horizon Year (2040) Without Project traffic conditions, with the exception of the following freeway segments and marge/diverge ramp junctions:

- I-15 Freeway Southbound, North of Weirick Road (#1) – LOS F PM peak hour only
- I-15 Freeway Southbound, Off-Ramp at Weirick Road (#2) – LOS F PM peak hour only
- I-15 Freeway Southbound, On-Ramp at Weirick Road (#3) – LOS F PM peak hour only
- I-15 Freeway Southbound, Between Weirick Road and Temescal Canyon Road (#4) – LOS F PM peak hour only
- I-15 Freeway Southbound, Off-Ramp at Temescal Canyon Road (#5) – LOS F PM peak hour only
- I-15 Freeway Northbound, North of Weirick Road (#8) – LOS E AM and PM peak hours
- I-15 Freeway Northbound, On-Ramp at Weirick Road (#9) – LOS E AM peak hour only

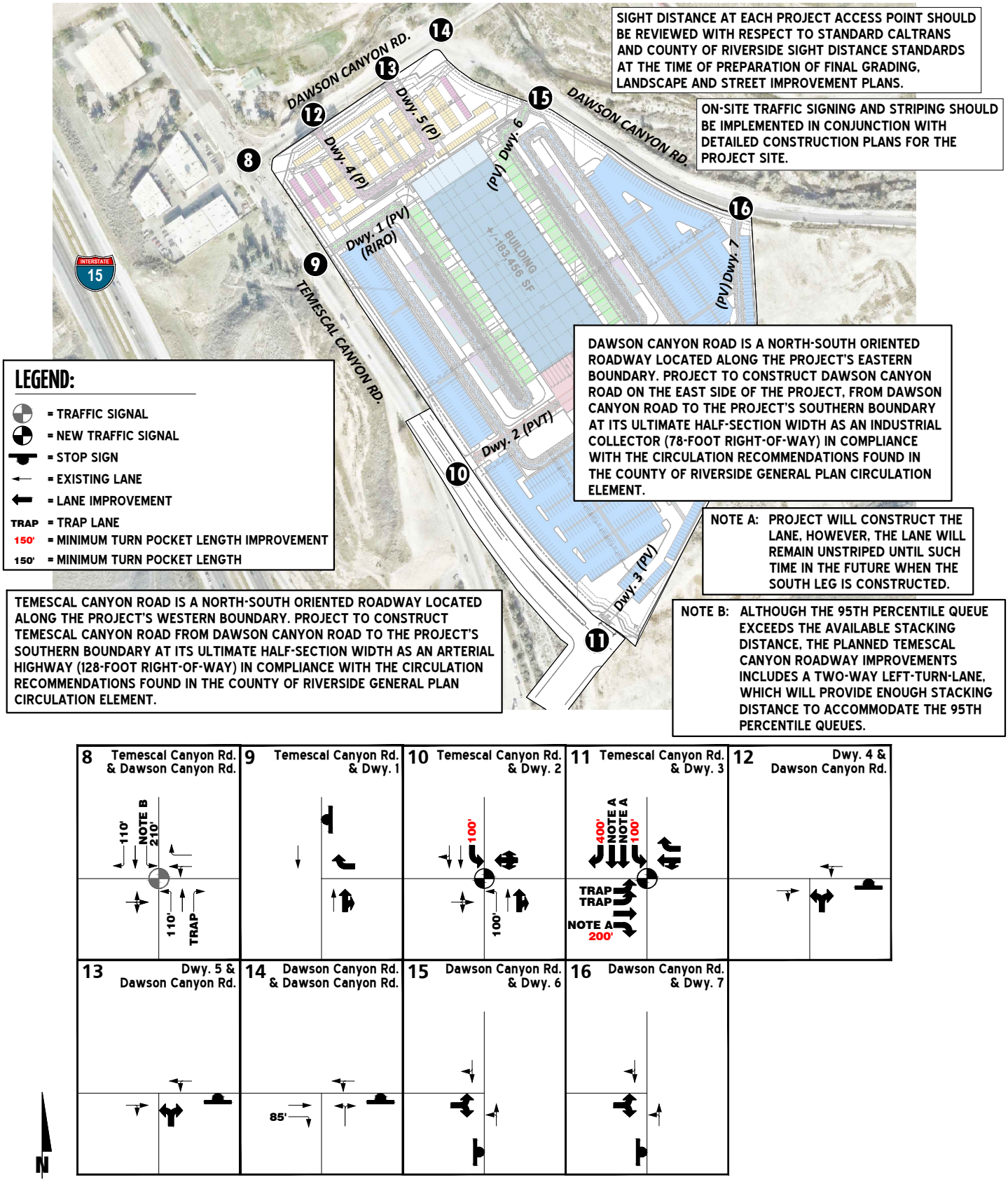
With the addition of Project traffic, there are no additional study area freeway segments or merge/diverge ramp junctions anticipated to operate at an unacceptable LOS during the peak hours, in addition to the segments and ramp junctions identified under Horizon Year (2040) Without Project.

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The following recommendations are based on the improvements needed to accommodate site access. Exhibit 1-4 shows the site adjacent recommendations.

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS



At the intersections of Temescal Canyon Road & Dawson Canyon Road (#8) and Dawson Canyon Road & Dawson Canyon Road (#14), no improvements are recommended; the existing traffic control and intersection geometrics should be maintained.

Recommendation 1 – ***Temescal Canyon Road & Driveway 1 (#9)*** – The following improvements are necessary to accommodate site access:

- Project to construct a 2nd northbound through lane.
- Project to install a stop control on the westbound approach and a right turn lane (driveway).

Recommendation 2 – ***Temescal Canyon Road & Driveway 2 (#10)*** – The following improvements are necessary to accommodate site access:

- Project to install a traffic signal.
- Project to construct a 2nd northbound through lane.
- Project to construct a southbound left turn lane with a minimum of 100-feet of storage.
- Project to construct a westbound shared left-right turn lane (driveway).

Recommendation 3 – ***Temescal Canyon Road & Driveway 3 (#11)*** – The following improvements are necessary to accommodate site access:

- Project to install a traffic signal.
- Project to construct a southbound left turn lane with a minimum of 100-feet of storage, and a southbound right turn lane with a minimum of 400-feet of storage. The Project will provide pavement to accommodate two southbound through lanes in the future, however the lanes will remain unstriped/hatched until such time in the future when the extension is constructed, and the receiving lanes have been striped.
- Project to construct dual eastbound left turn lanes and an eastbound through lane. The Project will provide pavement to accommodate an eastbound right turn lane with a minimum of 200-feet of storage, however the lane will remain unstriped/hatched until such time in the future when the extension is constructed, and the receiving lanes have been striped.
- Project to construct a westbound shared left-through-right turn lane (driveway).

Recommendation 4 – ***Driveway 4 & Dawson Canyon Road (#12)*** – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the northbound approach and a northbound shared left-right turn lane (driveway).

Recommendation 5 – ***Driveway 5 & Dawson Canyon Road (#13)*** – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the northbound approach and a northbound shared left-right turn lane (driveway).

Recommendation 6 – Dawson Canyon Road & Driveway 6 (#15) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the eastbound approach and an eastbound shared left-right turn lane (driveway).

Recommendation 7 – Dawson Canyon Road & Driveway 7 (#16) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the eastbound approach and an eastbound shared left-right turn lane (driveway).

Recommendation 8 – Temescal Canyon Road is a north-south oriented roadway located along the Project's western boundary. Project to realign and construct Temescal Canyon Road from Dawson Canyon Road to the Project's southern boundary at its ultimate half-section width as an Arterial Highway (128-foot right-of-way) in compliance with the circulation recommendations found in the County of Riverside General Plan Circulation Element. The Project will construct Temescal Canyon Road to align with the future extension of Temescal Canyon Road that is proposed to run along the northeast side of the I-15 Freeway. Driveway 3 of the proposed Project will align with the existing Temescal Canyon Road. The Project's Civil Engineer is preparing an alignment study which will identify the placement and lane geometrics of the realigned intersection of Temescal Canyon Road North and Temescal Canyon Road (existing).

Recommendation 9 – Dawson Canyon Road is a north-south and east-west oriented roadway located along the Project's eastern and northern boundaries. Project to construct Dawson Canyon Road from Temescal Canyon Road to the Project's northeastern boundary at its ultimate half-section width as an Industrial Collector (78-foot right-of-way) in compliance with the circulation recommendations found in the County of Riverside General Plan Circulation Element.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and County of Riverside sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

Per the proposed plans for the reconfiguration of Temescal Canyon Road, there will be approximately 1,000 feet between the I-15 Northbound Ramps (intersection #6) and the future realigned Temescal Canyon Road (intersection #11). Based on the queues under Horizon Year (2040) With Project conditions, with improvements, the 95th percentile queue is not anticipated to exceed 700-feet during the AM peak hour in the eastbound direction and 650-feet during the PM peak hour. As such, with the reconfiguration of Temescal Canyon Road and the proposed on-site Project design features, as discussed above, Temescal Canyon Road is not anticipated to experience queuing issues during the AM or PM peak hours under Horizon Year (2040) With Project traffic conditions. The Horizon Year (2040) With Project queuing worksheets are provided in Appendix 1.2.

The queuing analysis has been conducted utilizing the SimTraffic software. SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 50th percentile, or average, queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). Many agencies utilize the 95th percentile queues for design purposes.

The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five times, during the weekday AM and weekday PM peak hours, and has been seeded for 60-minute periods with 60-minute recording intervals.

1.6.2 OFF-SITE RECOMMENDATIONS

The recommended improvements needed to address the cumulative deficiencies identified under Existing (2020), EAP (2022), EAPC (2022), and Horizon Year (2040) traffic conditions are shown in Table 1-3. For those improvements listed in Table 1-3 and not constructed as part of the Project, the Applicant's responsibility for the Project's contributions towards deficient intersections is fulfilled through payment of fair share and/or TUMF/DIF fees (if applicable) that would be assigned to construction of the identified recommended improvements. The Project Applicant would be required to pay TUMF/DIF and/or fair share fees consistent with the County's requirements (see Section 8 *Local and Regional Funding Mechanisms*).

Table 1-3

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Existing (2020)	E+P	EAP (2022) Without Temescal Canyon Road Extension	EAP (2022) With Temescal Canyon Road Extension	EAPC (2022) Without Temescal Canyon Road Extension	EAPC (2022) With Temescal Canyon Road Extension	Horizon Year (2040) Without Project	Horizon Year (2040) With Project	Improvements in County TUMF/DIF?[1]	Project Responsibility[3]	Fair Share %[4]
2	I-15 SB Ramps & Temescal Canyon Rd.	Caltrans, County of Riverside	None	None	None	None	Add SB left turn lane	Same	Same	Same	Yes (TUMF)[2]	Fees	N/A
							Add 2nd SB right turn lane	Same	Same	Same	Yes (TUMF)[2]	Fees	
3	Temescal Canyon Rd. & Trilogy Pkwy.	County of Riverside	None	None	None	None	Add 2nd NB through lane	Not Applicable[5]	Not Applicable[5]	Not Applicable[5]	Yes (TUMF)[2]	Fees	N/A
							Add 2nd SB through lane	Not Applicable[5]	Not Applicable[5]	Not Applicable[5]	Yes (TUMF)[2]	Fees	
4	Campbell Ranch Rd. & Temescal Canyon Rd.	County of Riverside	None	None	None	None	Add 2nd WB through lane	Not Applicable[5]	Not Applicable[5]	Not Applicable[5]	Yes (TUMF)[2]	Fees	N/A
6	I-15 NB Ramps & Temescal Canyon Rd.	Caltrans, County of Riverside	None	None	None	None	Add NB right turn lane	Same	Same	Same	Yes (TUMF)[2]	Fees	N/A
							Add 2nd NB right turn lane	Same	Same	Same	Yes (TUMF)[2]	Fees	
							Restripe the EB approach to provide dual left turn lanes and a through lane	Same	Same	Same	Yes (TUMF)[2]	Fees	
11	Temescal Canyon Rd. & Driveway 3	County of Riverside	None	Install a Traffic Signal	Same	Same	Same	Same	Same	Same	Yes (DIF)	Construct	5.84%
				Add EB left turn lane	Same	Same	Same	Same	Same	Same	No	Construct	
				Add 2nd EB left turn lane	Same	Same	Same	Same	Same	Same	No	Construct	
				Add EB through lane	Same	Same	Same	Same	Same	Same	No	Construct	
				Add WB shared left-through-right turn lane	Same	Same	Same	Same	Not Applicable[6]	Same	No	Construct	
				Add SB left turn lane	Same	Same	Same	Same	Same	Same	No	Construct	
				Add SB through lane[7]	Same	Same	Same	Same	Same	Same	No	Construct	
				Add 2nd SB through lane[7]	Same	Same	Same	Same	Same	Same	No	Construct	
				Add SB right turn lane	Same	Same	Same	Same	Same	Same	No	Construct	
				Add EB right turn lane[7]	Same	Same	Same	Same	Same	Same	No	Construct	
							Modify the traffic signal to implement overlap phasing for the SB right turn lane	Same	Same	Same	No	Fair Share	
								Add NB left turn lane	Same	Same	No	Fair Share	
								Add 2nd NB left turn lane	Same	Same	No	Fair Share	
								Add NB through lane	Same	Same	No	Fair Share	
								Add 2nd NB through lane	Same	Same	No	Fair Share	
								Modify the traffic signal to implement overlap phasing for the EB right turn lane	Same	Same	No	Fair Share	

[1] Improvements included in TUMF Nexus, or County of Riverside DIF fee programs.
[2] Although the interchange is identified as a TUMF interchange, the intersection is not currently identified on the Northwest Zone 5-Year Transportation Improvement Program Amendment (adopted September 30, 2017).
[3] Identifies the Project's responsibility to construct an improvement or contribute fair share towards the implementation of the improvements shown.
[4] Program improvements constructed by project may be eligible for fee credit, at discretion of County. See Table 9-1 for Fair Share Calculations.
[5] With the future extension of Temescal Canyon Road, traffic volumes are anticipated to shift, therefore removing the deficiency at this location. As such, the improvement is not needed under "With Temescal Canyon Road Extension" conditions.
[6] Improvement will be constructed by the Project as part of the Project design features. As such, this improvement is not needed for "Without Project" conditions.
[7] Project will provide pavement to accommodate the improvement, however the lane will remain unstriped until such time in the future when the south leg of the intersection is constructed, and the receiving lanes have been striped.

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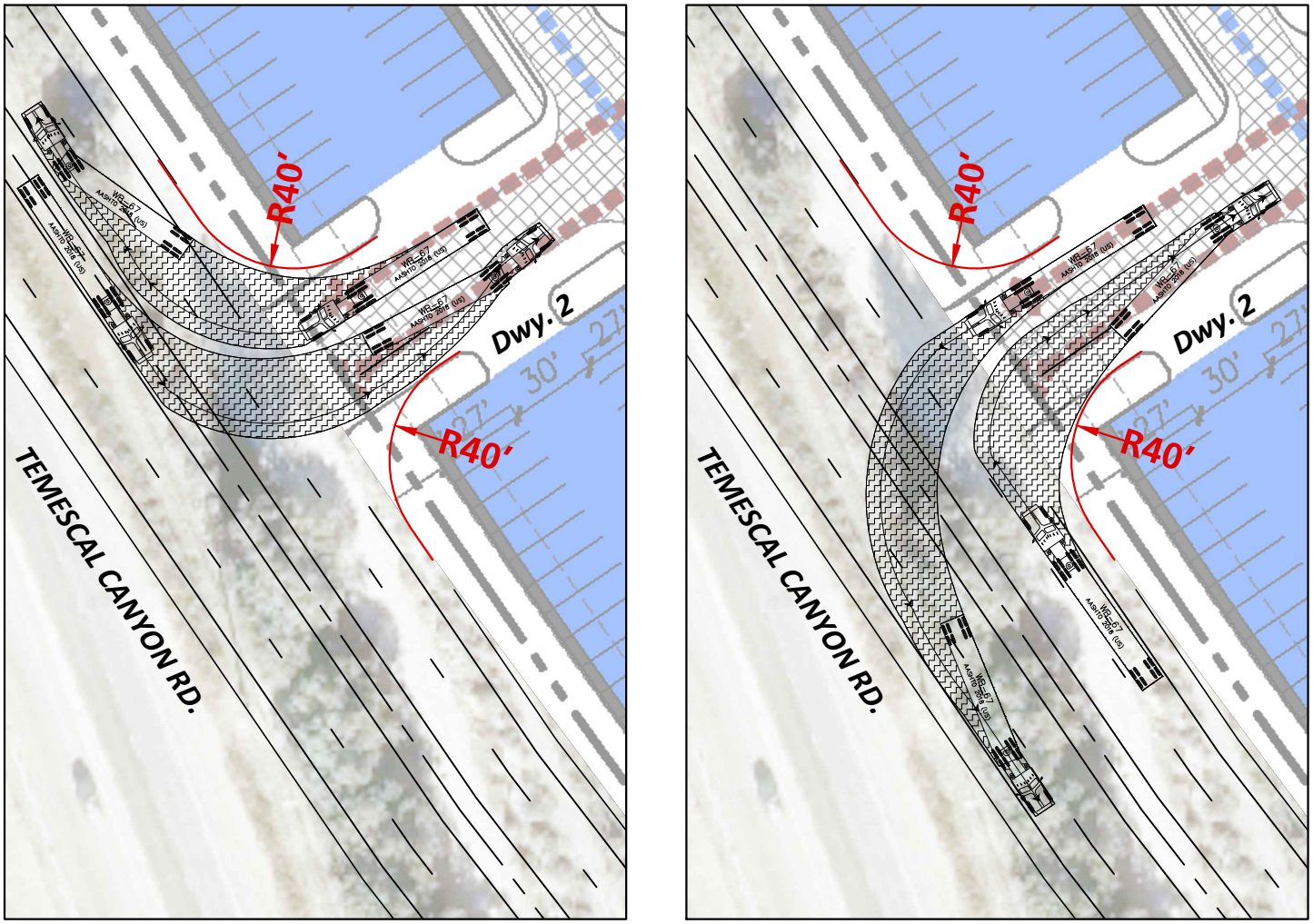
1.7 TRUCK ACCESS

Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-5). A WB-67 truck (53-foot trailer) has been utilized for the purposes of this analysis.

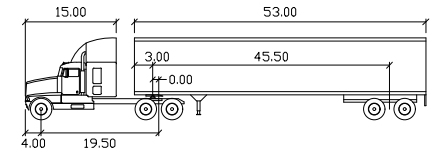
As shown on Exhibit 1-5, the following curb radius changes are necessary in order to accommodate the ingress and egress of heavy trucks:

- Driveway 2 on Temescal Canyon Road should be modified to provide a 40-foot curb radius on the northeast and southeast corners.

EXHIBIT 1-5: TRUCK ACCESS



LEGEND:



WB-67

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

GRAPHIC SCALE
0 30 60
1"=60'

N

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with County of Riverside and Caltrans traffic study guidelines. (2)

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

County of Riverside and City of Corona

The County of Riverside and City of Corona require signalized intersection operations analysis based on the methodology described in the HCM (6th Edition). Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 10) analysis software package.

The traffic modeling and signal timing optimization software package Synchro (Version 10) is utilized to analyze signalized intersections within the County of Riverside and City of Corona. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths	80.01 and up	F	F

Source: HCM, 6th Edition

A saturation flow rate of 1900 has been utilized for all study area intersections located within the County of Riverside and City of Corona. The peak hour traffic volumes are adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g., PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

2.2.2 UNSIGNALIZED INTERSECTIONS

The County of Riverside and City of Corona require the operations of unsignalized intersections be evaluated using the methodology described the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM, 6th Edition

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by the Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices *(CA MUTCD)*. (6)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The Caltrans CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (6) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics (e.g., located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

Traffic signal warrant analyses were performed for the following unsignalized study area intersection shown in Table 2-3:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
10	Temescal Canyon Rd. & Driveway 2 – Future Intersection	County of Riverside
11	Temescal Canyon Rd. & Driveway 3 – Future Intersection	County of Riverside
12	Driveway 4 & Dawson Canyon Rd. – Future Intersection	County of Riverside
13	Driveway 5 & Dawson Canyon Rd. – Future Intersection	County of Riverside
14	Dawson Canyon Rd. & Dawson Canyon Rd.	County of Riverside
15	Dawson Canyon Rd. & Driveway 6 – Future Intersection	County of Riverside
16	Dawson Canyon Rd. & Driveway 7 – Future Intersection	County of Riverside

Although unsignalized, traffic signal warrants have not been performed for the intersection of Driveway 1 at Temescal Canyon Road since this intersection will be restricted to right-in/right-out access only. The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *EAP (2022) Traffic Conditions,* Section 6 *EAPC (2022) Traffic Conditions,* and Section 7 *Horizon Year (2040) Traffic Conditions* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 FREEWAY OFF-RAMP QUEUING ANALYSIS

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the I-15 Freeway at Weirick Road and Temescal Canyon Road interchanges. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-15 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays.

Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The queue length reported is for the lane with the highest queue in the lane group. The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed it is simply based on statistical calculations.

2.5 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance, the traffic study has evaluated all freeway segments where the Project is anticipated to contribute 50 or more peak hour one-way trips, in an effort to conduct a conservative analysis and overstate as opposed to understand potential deficiencies.

The freeway system in the study area has been broken into segments defined by the freeway-to-arterial interchange locations. The freeway segments have been evaluated in this TA based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in the HCM and performed using HCS7 software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in December 2019. These existing freeway geometrics have been utilized for Existing (2020), EAP (2022), EAPC (2022), and Horizon Year (2040) traffic conditions. The I-15 Freeway mainline volume data was obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the I-15 Freeway north of Weirick Road. The data was obtained from November 2019. In an effort to conduct a conservative analysis, the maximum value observed within the 3-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the basic freeway segment analysis. (7)

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

Level of Service	Description	Density Range (pc/mi/ln)[1]
A	Free-flow operations in which vehicles are relatively unimpeded in their ability to maneuver within the traffic stream. Effects of incidents are easily absorbed.	0.0 – 11.0
B	Relative free-flow operations in which vehicle maneuvers within the traffic stream are slightly restricted. Effects of minor incidents are easily absorbed.	11.1 – 18.0
C	Travel is still at relative free-flow speeds, but freedom to maneuver within the traffic stream is noticeably restricted. Minor incidents may be absorbed, but local deterioration in service will be substantial. Queues begin to form behind significant blockages.	18.1 – 26.0
D	Speeds begin to decline slightly and flows, and densities begin to increase more quickly. Freedom to maneuver is noticeably limited. Minor incidents can be expected to create queuing as the traffic stream has little space to absorb disruptions.	26.1 – 35.0
E	Operation at capacity. Vehicles are closely spaced with little room to maneuver. Any disruption in the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. Any incident can be expected to produce a serious disruption in traffic flow and extensive queuing.	35.1 – 45.0
F	Breakdown in vehicle flow.	>45.0

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM (6th Edition)

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

The freeway system in the study area has been broken into segments defined by freeway-to-arterial interchange locations where the Project is anticipated to contribute 50 or more peak hour trips (see Table 1-3). Although the HCM indicates the influence area for a merge/diverge junction is 1,500 feet, the analysis presented in this traffic study has been performed at all ramp locations with respect to the nearest on or off-ramp at each interchange in an effort to be consistent with Caltrans guidance/comments on other projects Urban Crossroads has worked on in the region.

The freeway facility analysis is performed using the HCS7 software and analyzes the freeway facility as a whole, including both freeway segments and ramp junctions. The measure of effectiveness (reported in passenger car/mile/lane) is calculated based on the existing number of travel lanes, number of lanes at the on and off-ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

TABLE 2-5: DESCRIPTION OF FREEWAY MERGE AND DIVERGE LOS

Level of Service	Density Range (pc/mi/ln)[1]
A	≤10.0
B	10.0 – 20.0
C	20.0 – 28.0
D	28.0 – 35.0
E	>35.0
F	Demand Exceeds Capacity

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM (6th Edition)

Similar to the basic freeway segment analysis, the I-15 Freeway volume data was obtained from the Caltrans maintained PeMS website for the segments of the I-15 Freeway north of Weirick Road. The ramp data (per the count data presented in Appendix 3.1) was then utilized to flow conserve the mainline volumes to determine the remaining I-15 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from November 2019. In an effort to conduct a conservative analysis, the maximum value observed within the 3-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic and actual vehicles (as opposed to PCE volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis. (7)

2.7 MINIMUM LEVEL OF SERVICE (LOS)

2.7.1 COUNTY OF RIVERSIDE

The definition of an intersection deficiency has been obtained from the County of Riverside General Plan. Riverside County General Plan Policy C 2.1 states that the County will maintain the following County-wide target LOS:

The following minimum target levels of service have been designated for the review of development proposals in the unincorporated areas of Riverside County with respect to transportation impacts on roadways designated in the Riverside County Circulation Plan which are currently County maintained, or are intended to be accepted into the County maintained roadway system:

- *LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well as those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*

- *LOS E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed.*

The applicable minimum LOS utilized for the purposes of this analysis is LOS D per the County-wide target LOS for projects located within a Community Development Area of the Temescal Canyon Area Plan.

2.7.2 CITY OF CORONA

In accordance with the City of Corona's General Plan, the following intersection LOS criteria from the General Plan shall be applied:

- LOS C or better shall be maintained for local intersections in residential/industrial areas.
- LOS D or better shall be maintained on collector and arterial intersections.
- LOS E will be permitted at specific ramp-to-arterial intersections, and other locations as approved by the City Engineer.

2.7.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on SHS facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Consistent with the County of Riverside minimum LOS of LOS D, LOS D will be used as the target LOS for both arterial-to-freeway ramps and freeway mainline segments and ramp junctions.

2.8 DEFICIENCY CRITERIA

2.8.1 INTERSECTIONS

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies. The following deficiency criteria has been utilized for the County of Riverside. To determine whether the addition of project-related traffic at a study intersection would result in a deficiency, the following will be utilized:

- A deficiency occurs at study area intersections if the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and the addition of project trips causes the peak hour LOS of the study area intersection to operate at unacceptable LOS (i.e., LOS E or F). Per the County of Riverside traffic study guidelines, for intersections currently operating at unacceptable LOS (LOS E or F), a deficiency will occur if the Project contributes 50 or more peak hour trips to pre-project traffic conditions.

2.8.2 CALTRANS FACILITIES

To determine whether the addition of project traffic to the SHS freeway segments would result in a deficiency, the following will be utilized:

- The traffic study finds that the LOS of a segment will degrade from D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition (i.e., contributing 50 or more peak hour trips). A segment that is operating at or near capacity is deemed to be deficient.

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

Improvements found to be included in the TUMF and/or DIF will be identified as such. For improvements that do not appear to be in either of the pre-existing fee programs, a fair share contribution based on the Project's proportional share may be imposed in order to address the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the County Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval).

If the intersection is currently operating at acceptable LOS under Existing traffic conditions, the Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future traffic less existing baseline traffic:

Project Fair Share % = Project Traffic / (Horizon Year (2040) Total Traffic – Existing (2020) Traffic)

If the intersection does not currently exist, but will be constructed sometime in the future, the Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to total future traffic:

Project Fair Share % = Project Traffic / (Horizon Year (2040) Total Traffic)

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the County of Riverside General Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and freeway facility operations analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the scoping agreement with County of Riverside staff (Appendix 1.1), the study area includes a total of 16 existing and future intersections as shown previously on Exhibit 1-2, where the Project is anticipated to contribute 50 or more peak hour trips or has been added at the direction of County staff. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 GENERAL PLAN CIRCULATION ELEMENTS

As noted previously, the Project site is located within the County of Riverside. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on County of Riverside General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the County of Riverside General Plan Circulation Element and Exhibit 3-3 illustrates the County of Riverside General Plan roadway cross-sections.

Arterial Highways can accommodate six travel lines. These facilities primarily serve through traffic to which access from abutting property shall be kept at a minimum. The following roadway is classified as an Arterial Highway within the study area:

- Temescal Canyon Road

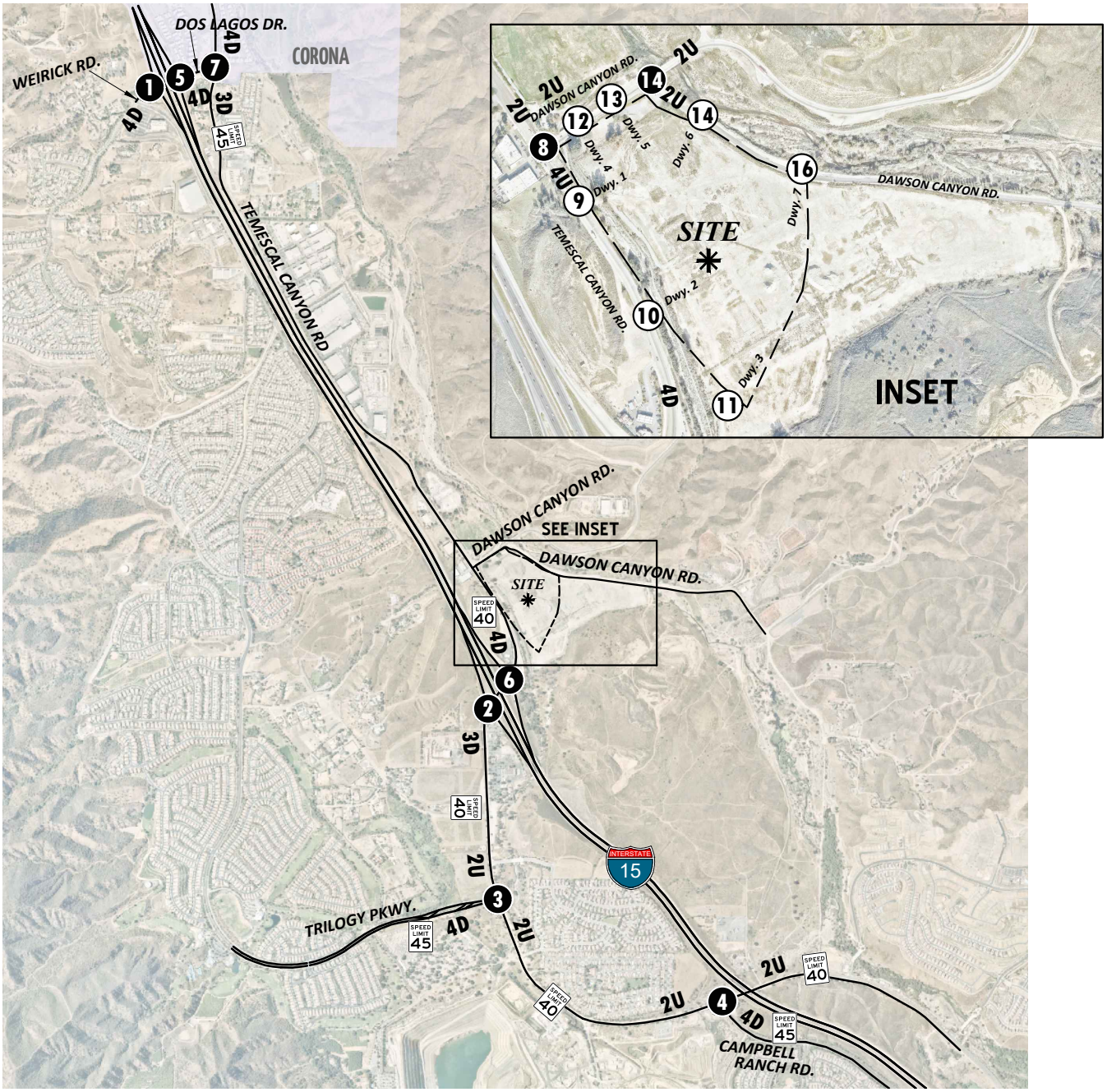
Major Highways can accommodate four travel lanes. These facilities serve property zoned for major industrial and commercial uses, or to serve through traffic. The following roadways are classified as a Major Highway within the study area:

- Weirick Road
- Dos Lagos Drive
- Temescal Canyon Road (at I-15 interchange and from Trilogy Parkway to Campbell Ranch Road)
- Trilogy Parkway
- Campbell Ranch Road

Collectors can accommodate two travel laves. These facilities provide access to residential land use, or commercial and industrial land use in the form of a cul-de-sac. The following roadway is classified as a collector within the study area:

- Temescal Canyon Road (from I-15 interchange to Trilogy Parkway)

EXHIBIT 3-1 (1OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

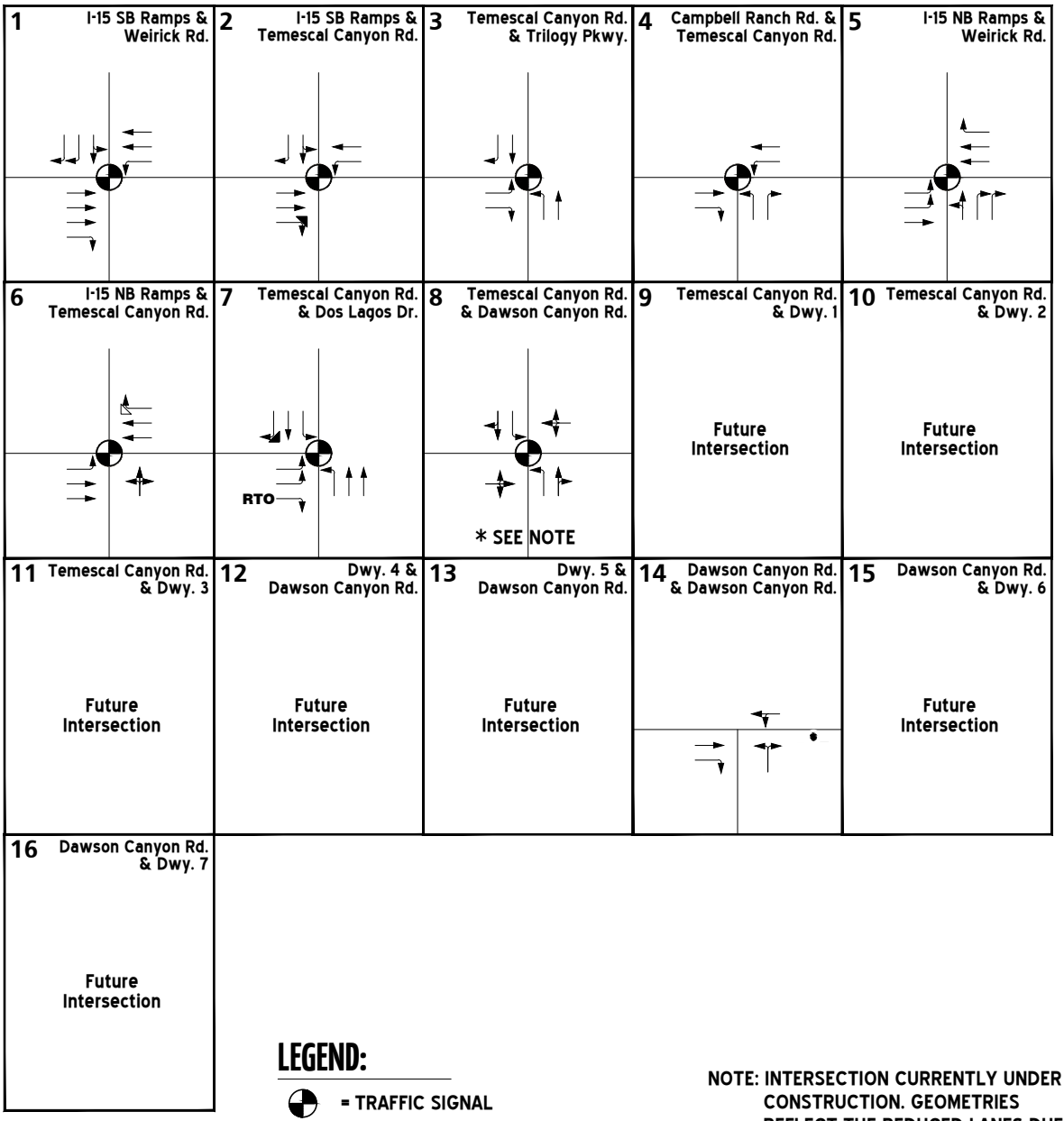


LEGEND:

- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

N

EXHIBIT 3-1 (2OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- = FREE RIGHT TURN
- = CHANNELIZED YIELD
- RTO = RIGHT TURN OVERLAP

NOTE: INTERSECTION CURRENTLY UNDER CONSTRUCTION. GEOMETRIES REFLECT THE REDUCED LANES DUE TO CONSTRUCTION.

N

EXHIBIT 3-2: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

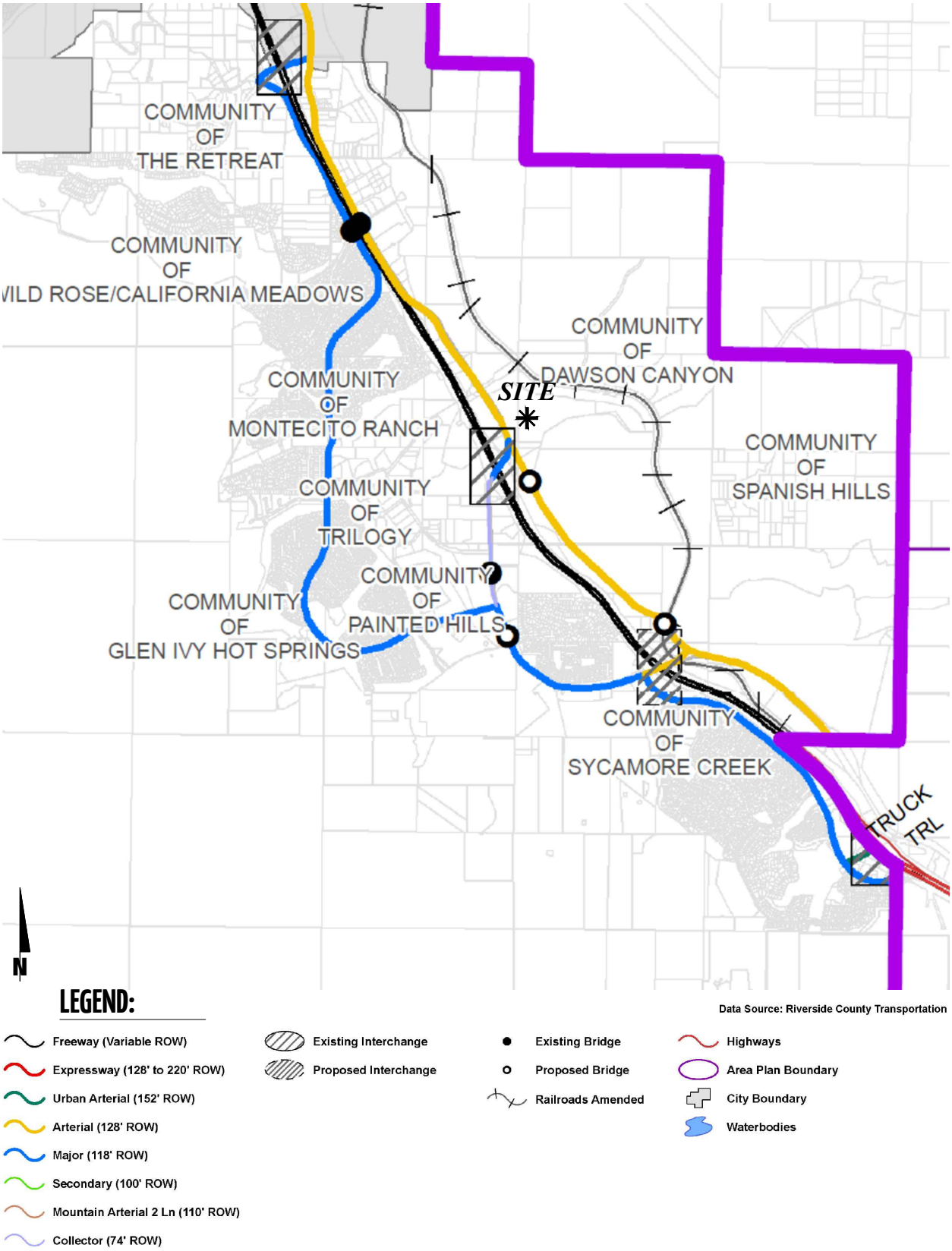
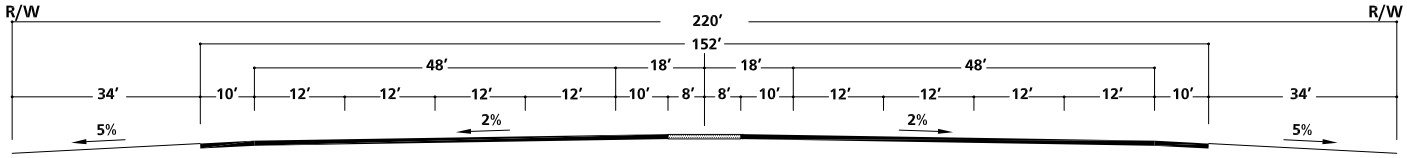
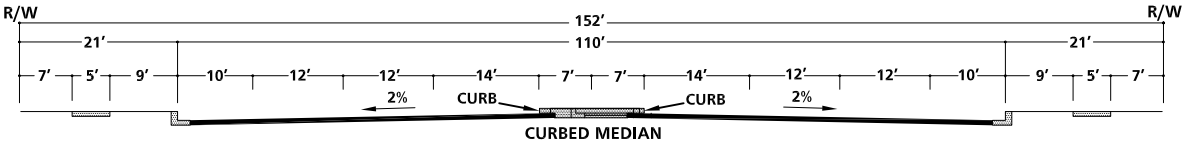


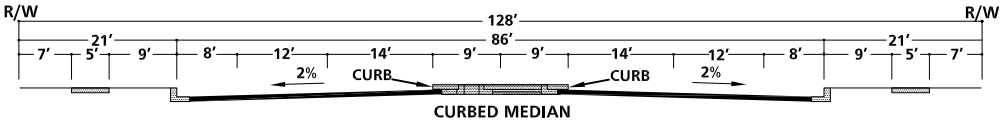
EXHIBIT 3-3: COUNTY OF RIVERSIDE GENERAL PLAN ROADWAY CROSS-SECTIONS



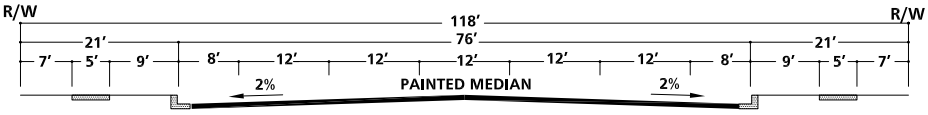
EXPRESSWAY - 8 LANES



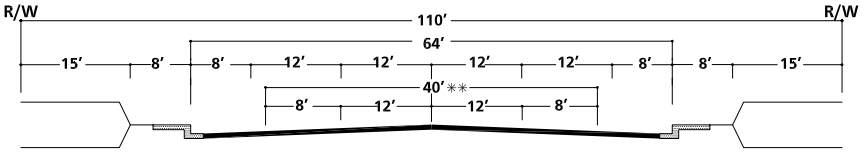
URBAN ARTERIAL HIGHWAY ✳



ARTERIAL HIGHWAY ✳

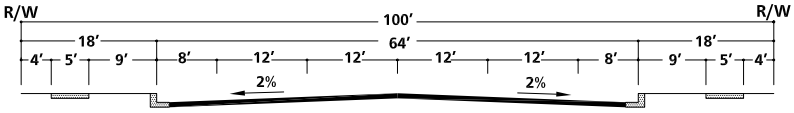


MAJOR HIGHWAY - 4 LANES

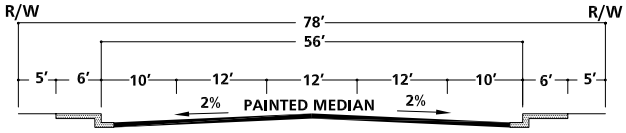


MOUNTAIN ARTERIAL - 2 TO 4 LANES

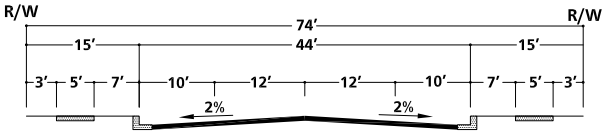
✳✳ 2 LANE SECTION



SECONDARY HIGHWAY



INDUSTRIAL COLLECTOR



COLLECTOR

✳ *IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.*

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE

3.3 CITY OF CORONA GENERAL PLAN CIRCULATION ELEMENT

Exhibits 3-4 and 3-5 show the City of Corona's General Plan Circulation Element and roadway cross-sections, respectively.

3.4 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the County of Riverside also includes a trails and bikeway system. The trails and bikeway system, shown on Exhibit 3-6, shows the proposed trails connected with major features within the County. There is a proposed historic trail along Temescal Canyon Road, a proposed design guidelines trail along Temescal Canyon Road and Dawson Canyon Road, and a proposed community trail on the south side of the Project site. Exhibit 3-7 shows the City of Corona existing and proposed bike trails.

Field observations conducted in December 2019 indicates nominal pedestrian and bicycle activity within the study area. Exhibit 3-8 illustrates the existing pedestrian facilities, including sidewalks and crosswalks. As shown on Exhibit 3-8, there are limited existing pedestrian facilities located along portions of Temescal Canyon Road, Trilogy Parkway, Weirick Road, and Dos Lagos Road within the study area.

3.5 TRANSIT SERVICE

The County of Riverside is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. There are currently no existing bus routes that serve the roadways within the study area in close proximity to the proposed Project. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-9. Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the Project Applicant work in conjunction with RTA to potentially accommodate bus service to the site.

3.6 TRUCK ROUTES

The County of Riverside's General Plan does not provide designated truck routes. Truck routes for the proposed Project have been determined based on discussions with County staff. These truck routes serve both the proposed Project and future cumulative development projects throughout the study area.

3.7 EXISTING TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in November 2019, while schools were in session. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

EXHIBIT 3-4: CITY OF CORONA GENERAL PLAN CIRCULATION ELEMENT

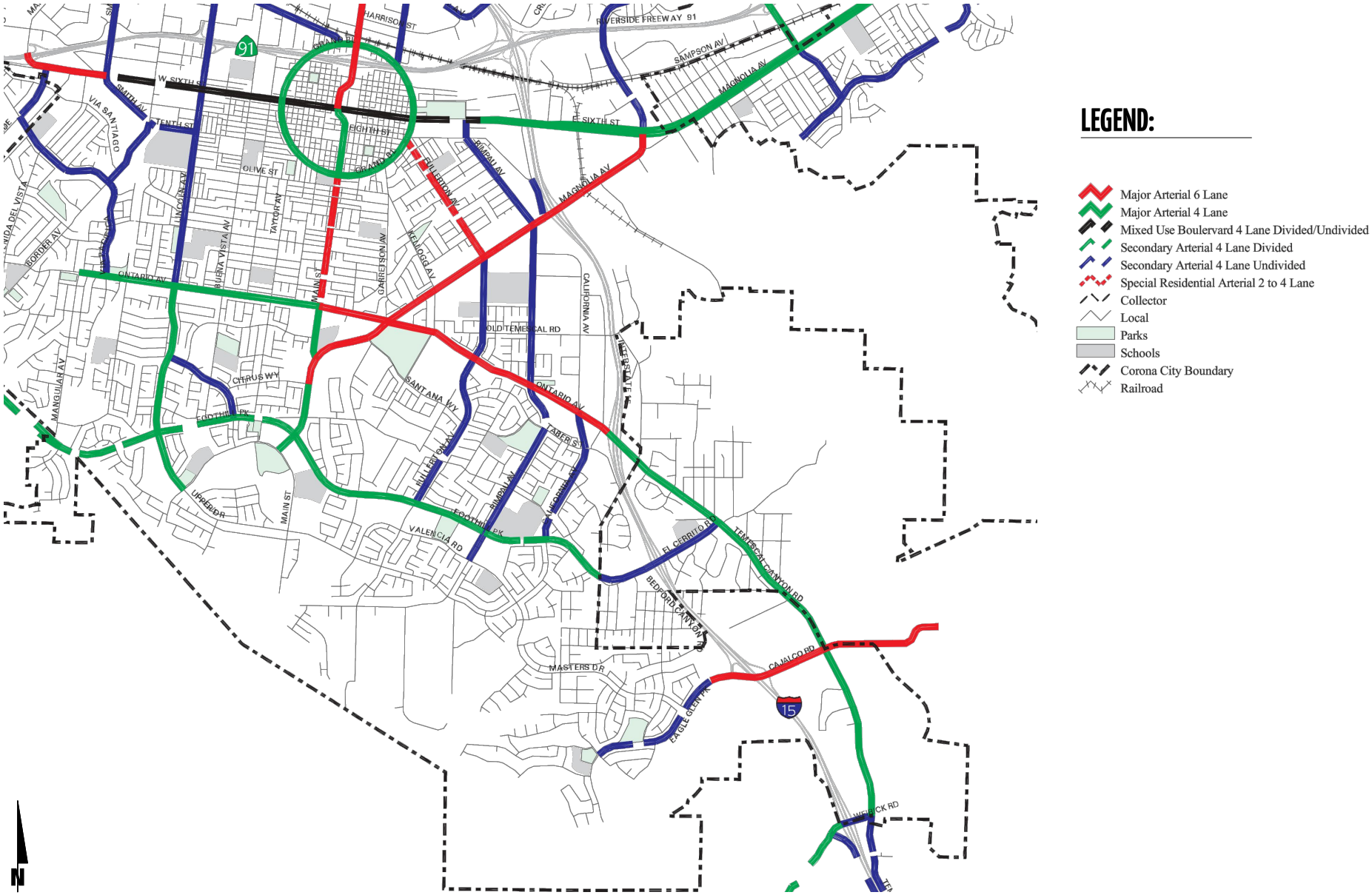
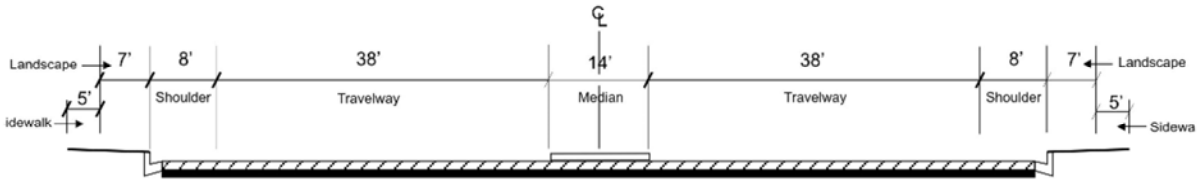
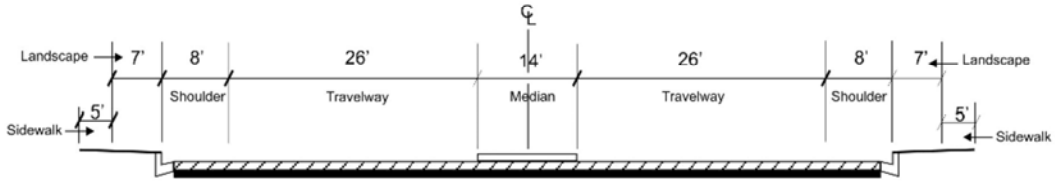


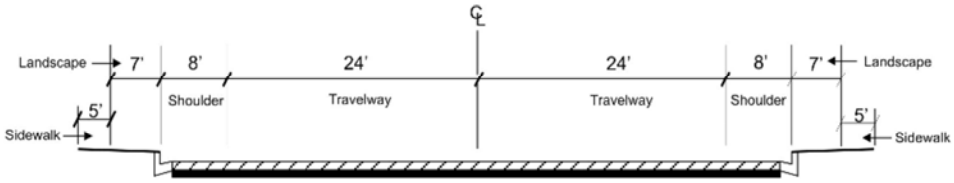
EXHIBIT 3-5 (1OF2): CITY OF CORONA ROADWAY CROSS-SECTIONS



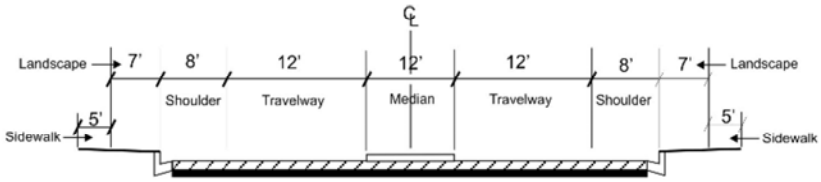
Major Arterial (6 lanes)
R.W. 130
Roadway 106



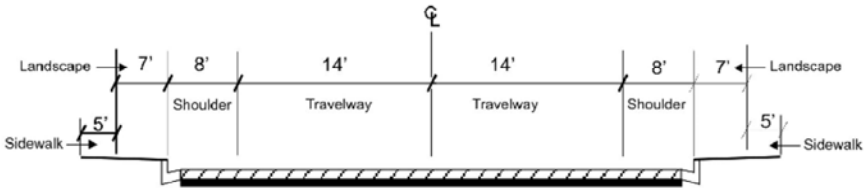
Major Arterial (4 lanes)
R.W. 106
Roadway 82



Secondary (4 lanes)
R.W. 88
Roadway 64

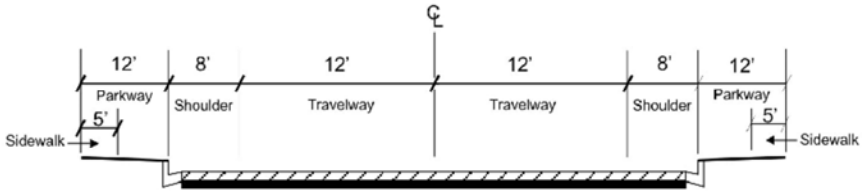


Divided Collector (2 lanes)
R.W. 76
Roadway 52

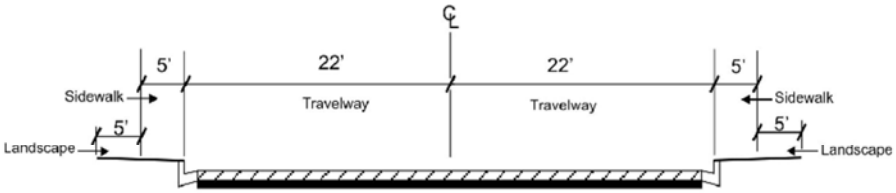


Collector (2 lanes)
R.W. 68
Roadway 44

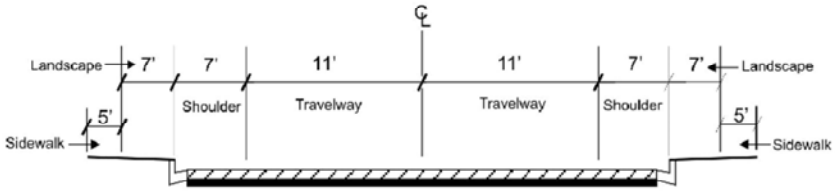
EXHIBIT 3-5 (2OF2): CITY OF CORONA ROADWAY CROSS-SECTIONS



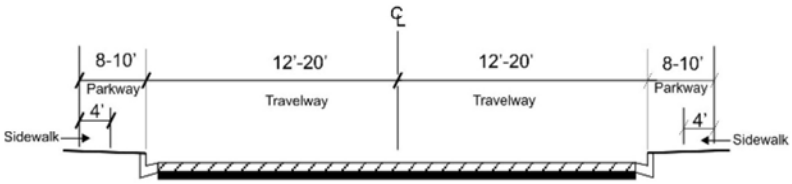
Local Street
R.W. 64
Roadway 40
Note: See local residential street Planning Policy 6.1.10



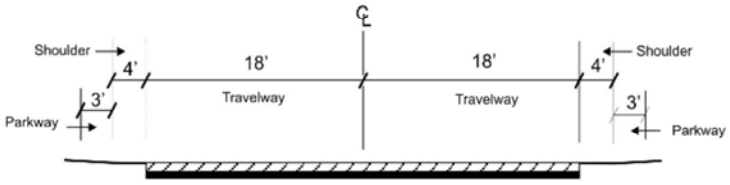
Local Industrial
R.W. 64
Roadway 44



Cul-De-Sac
R.W. 60
Roadway 36



Private Residential Street
R.W. 40-60
Roadway 24-40
Note: See local residential street Planning Policy 6.1.10



Rural Road (Traffic Volume)
R.W. 50
Roadway 36
Note: See local residential street Planning Policy 6.1.10

EXHIBIT 3-6: COUNTY OF RIVERSIDE TRAILS AND BIKEWAY SYSTEM

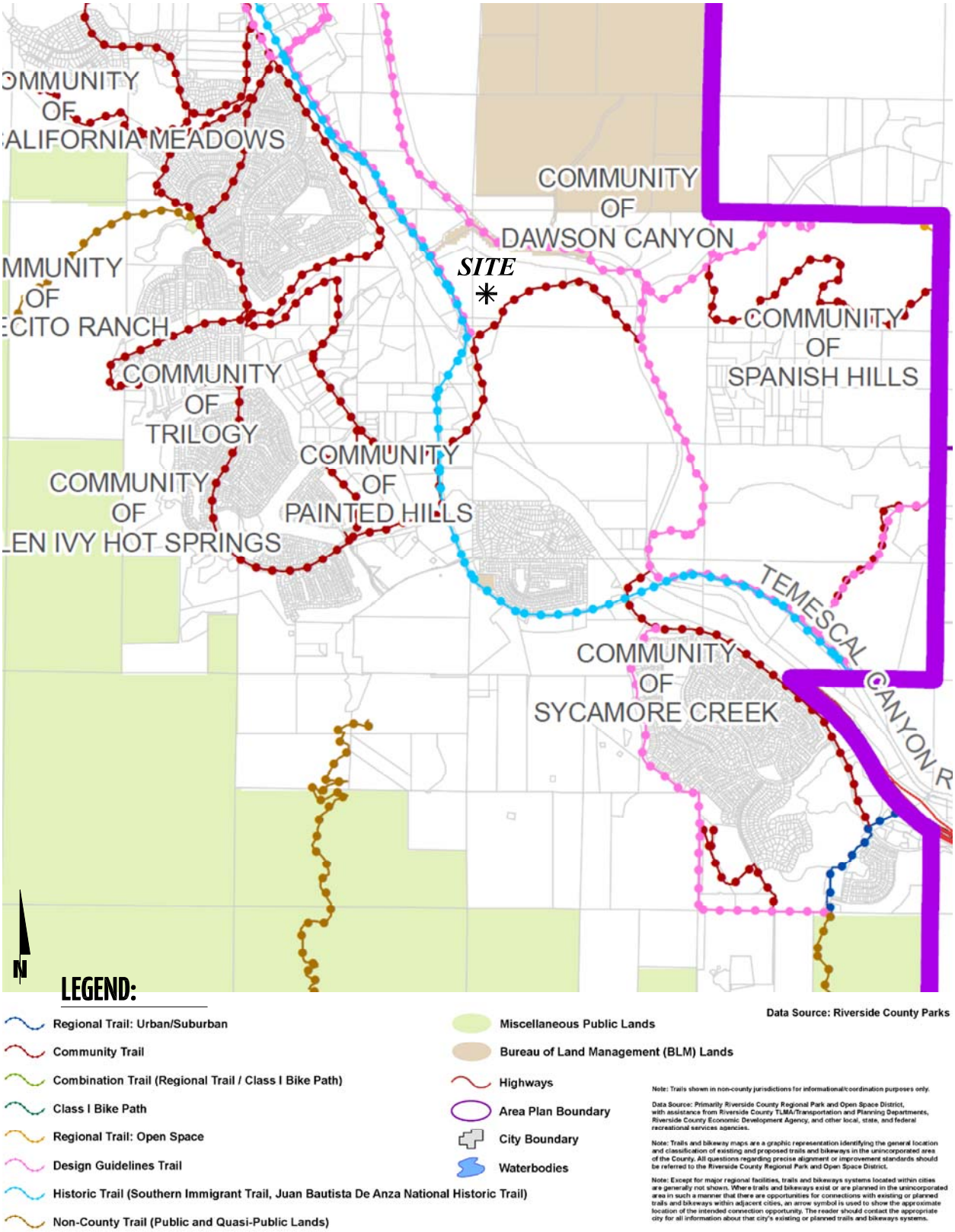
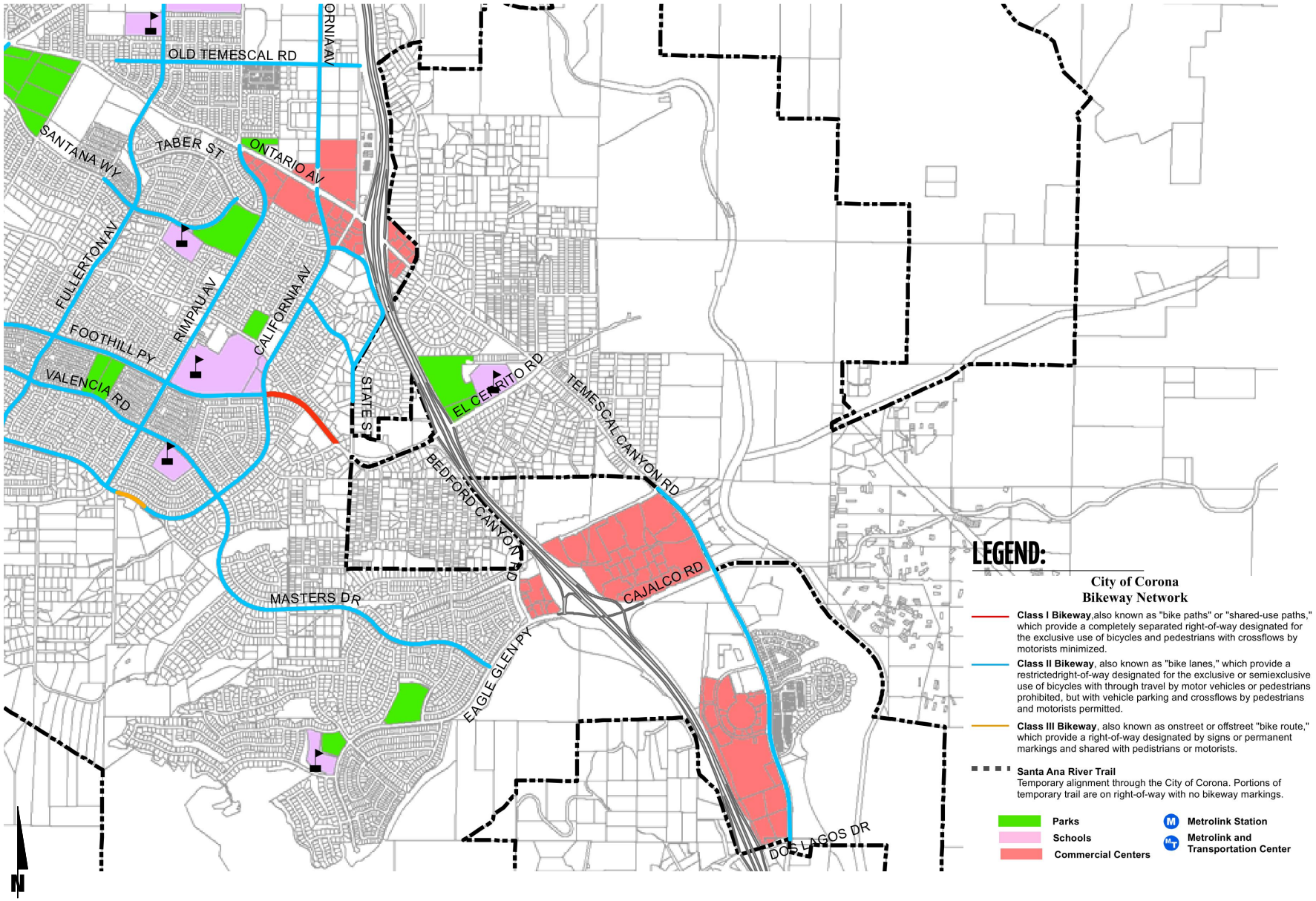


EXHIBIT 3-7: CITY OF CORONA EXISTING AND PROPOSED BIKE TRAILS



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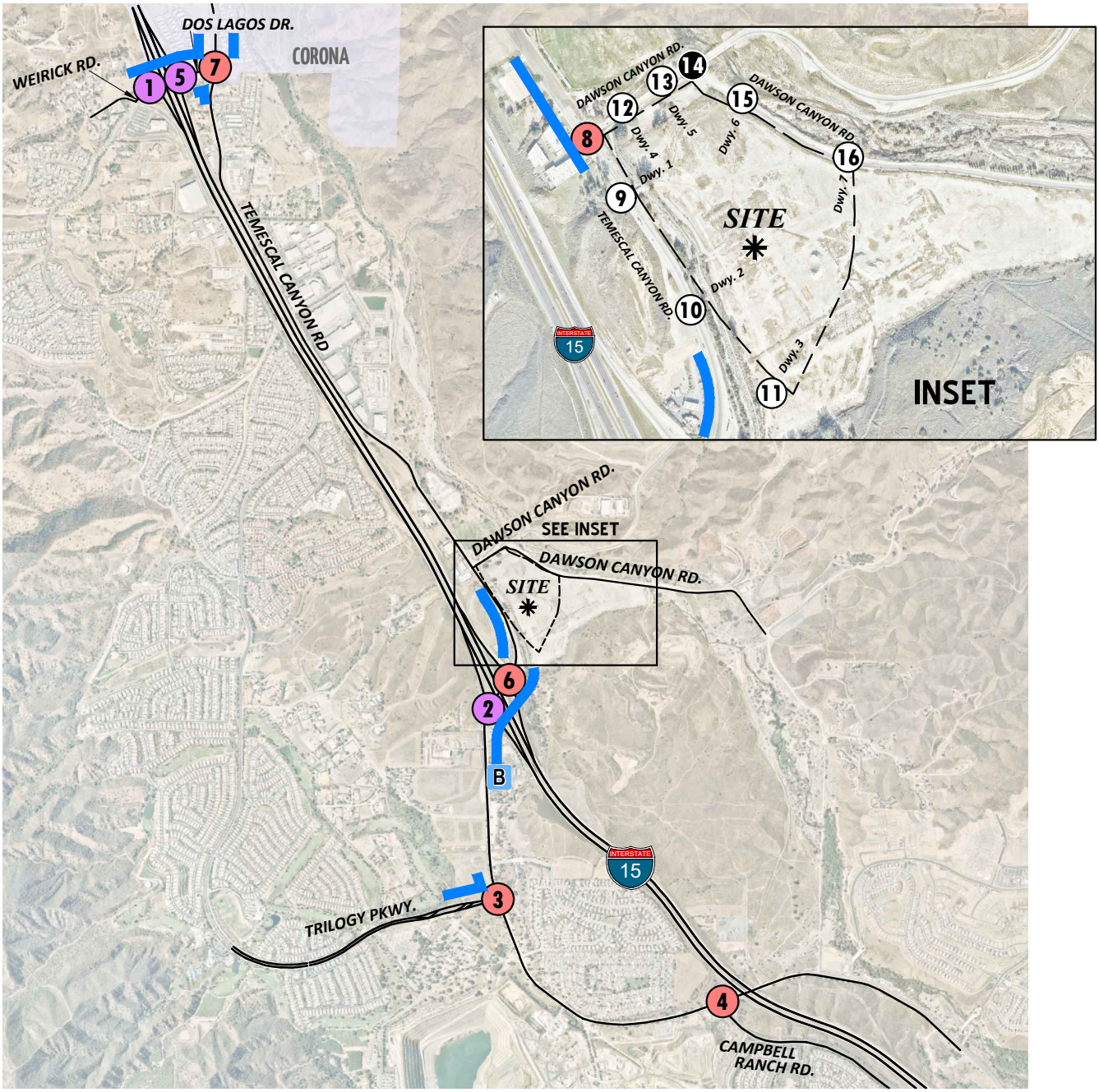
URBAN CROSSROADS

EXHIBIT 3-8: EXISTING PEDESTRIAN FACILITIES

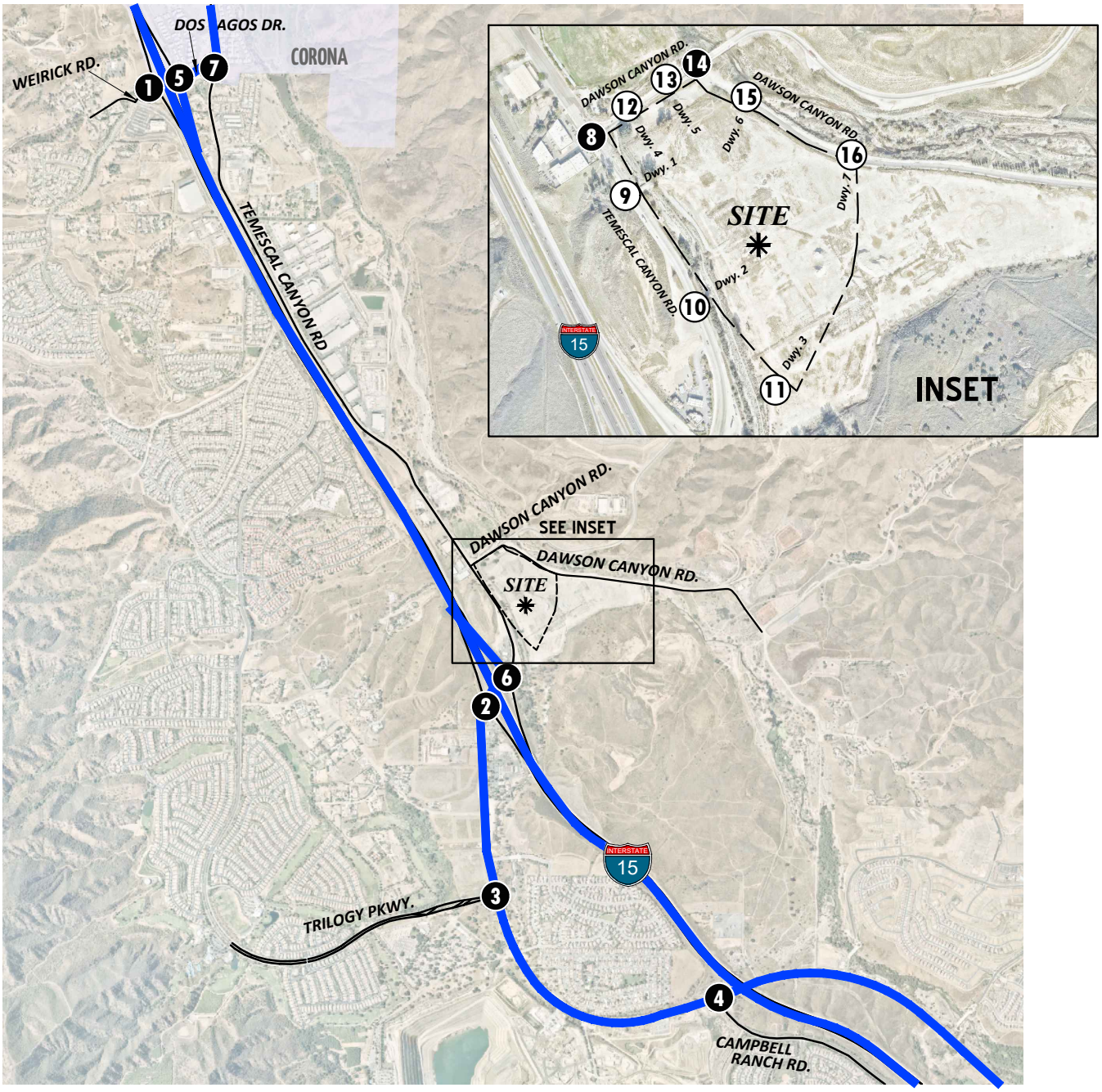


LEGEND:

- = SIDEWALK
- B = BUS STOP
- 0 = NO CROSSWALK
- 0 = FUTURE INTERSECTION
- 0 = CROSSWALK ON TWO APPROACHES
- 0 = CROSSWALK ON ONE APPROACH

N

EXHIBIT 3-9: EXISTING TRANSIT ROUTES



LEGEND:

= RTA ROUTE 205/206

N

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The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. At the time traffic counts were being collected, near-by schools were in session and operating on normal schedules. Temescal Canyon Road was under construction at the time traffic counts were being collected. However, there were no roadway closures or detours. As such, there are no factors that would indicate reduced traffic volumes along Temescal Canyon Road. A 2% growth rate has been applied to reflect 2020 conditions.

There is an existing Shell gas station located on the west side of Temescal Canyon Road, adjacent to the proposed Project site. At the time this traffic study was prepared, historic traffic counts were not readily available at the existing Shell gas station driveway along Temescal Canyon Road. Due to the currently ongoing COVID-19 pandemic, new traffic counts could not be collected since any collected data would likely be understated due to local school and business closures associated with COVID-19. As such, pursuant to discussions with County of Riverside staff, trip generation for the existing Shell gas station has been estimated based on the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 10th Edition (2017) for ITE Land Use Code 960 Super Convenience Market/Gas Station assuming 12 vehicle fueling positions. (8) The estimated traffic generated by the existing Shell gas station has been added to the existing driveway along Temescal Canyon Road.

The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access, and where there are currently no uses generating traffic. The traffic counts collected in November 2019 include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

To represent the effect large trucks, buses, and recreational vehicles have on traffic flow, all trucks were converted into passenger car equivalent (PCE). By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For this analysis, the following PCE factors have been used to estimate each turning movement: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks. These factors are consistent with the values recommended for use in the San Bernardino County CMP and are in excess of the factor recommended for use in the County of Riverside traffic study guidelines. (9) Although the County of Riverside has a recommended PCE factor of 2.0, the San Bernardino County CMP PCE factors have been utilized in an effort to conduct a more conservative analysis.

Existing weekday ADT volumes on arterial highways throughout the study area are shown on Exhibit 3-10. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 16.16 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 6.19 percent. As such, the above equation utilizing a factor of 16.16 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 6.19 percent (i.e., 1/0.0619 = 16.16) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes (in PCE) are shown on Exhibit 3-11.

3.8 EXISTING (2020) INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that all of the study area intersections are currently operating at an acceptable LOS during the peak hours (i.e., LOS D or better).

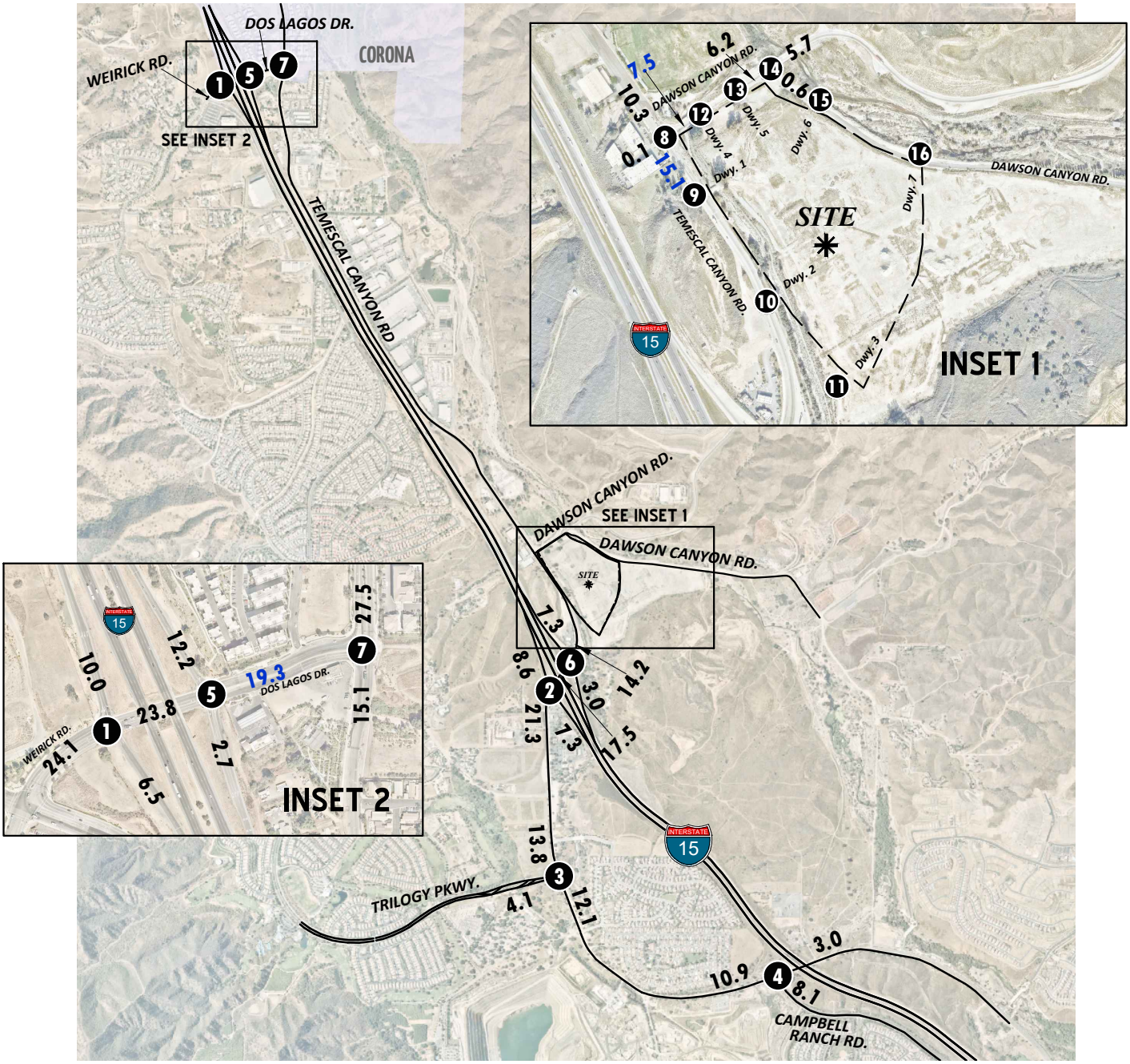
Temescal Canyon Road is currently under construction from Dos Lagos Drive to the I-15 Freeway interchange. As such, there are reduced lane geometries at the intersection of Temescal Canyon Road and Dawson Canyon Road (#8) due to the construction. As a result of the reduced lane geometries, queues were observed at this intersection in the northbound direction during the AM peak hour. In an effort to conduct a conservative analysis, the reduced lane geometries were evaluated for Existing (2020) traffic conditions. Although there were lane reductions, all directions of travel were open to traffic (i.e., no closures or detours).

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions is shown on Exhibit 3-12. The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

3.9 EXISTING (2020) TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. There are no unsignalized study area intersections that currently warrant a traffic signal for Existing (2020) traffic conditions. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

EXHIBIT 3-10: EXISTING (2020) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



LEGEND:

10.0 = ACTUAL (COUNT-BASED) VEHICLES PER DAY (1000'S)

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

N

EXHIBIT 3-11: EXISTING (2019) TRAFFIC VOLUMES (IN PCE)

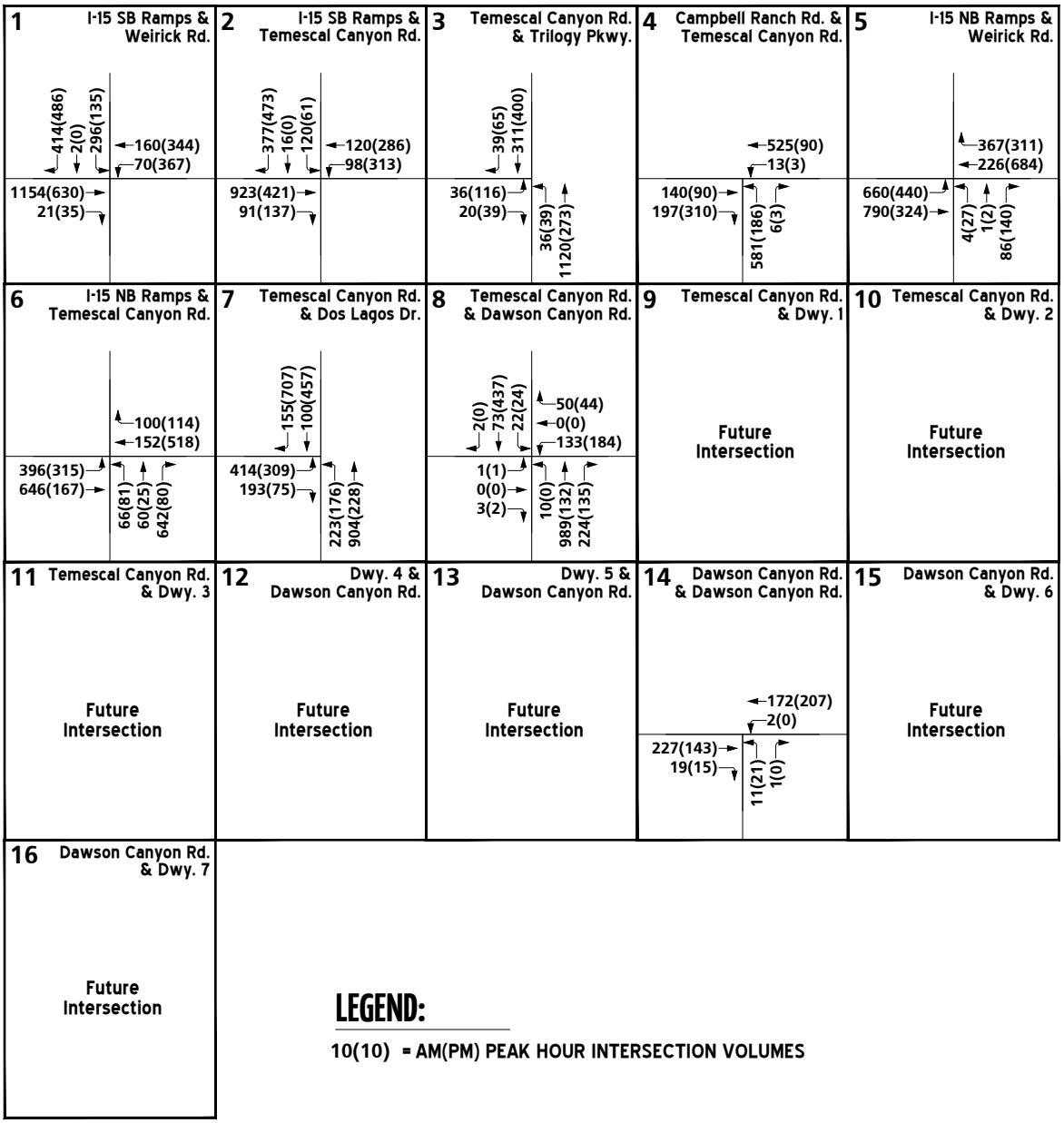


EXHIBIT 3-12: EXISTING (2020) SUMMARY OF LOS

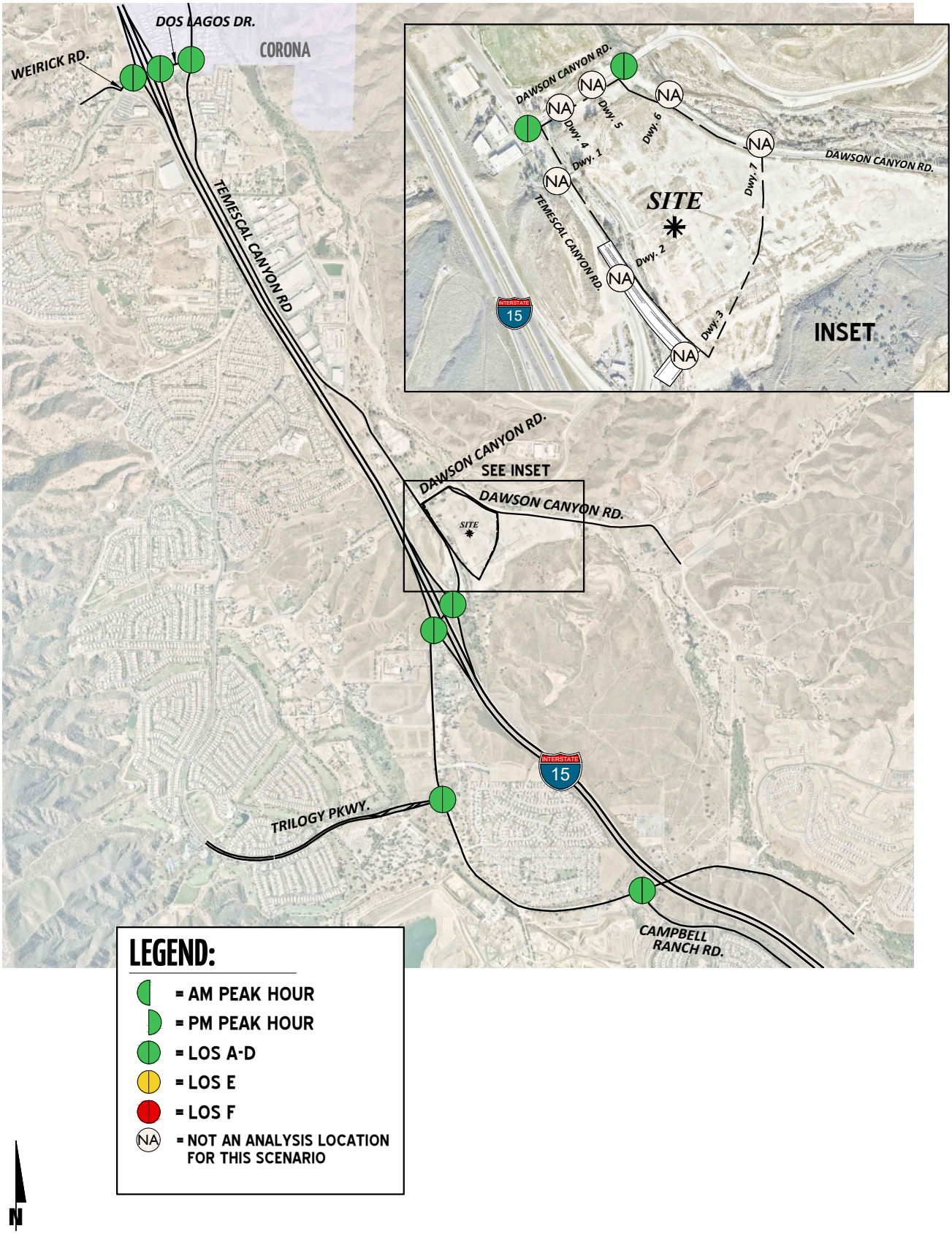


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Table 3-1

Intersection Analysis for Existing (2020) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay (secs.)[2]		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	I-15 SB Ramps & Weirick Rd.	TS	0	0	0	0	1	2	0	3	1	1	2	0	20.9	25.7	C	C
2	I-15 SB Ramps & Temescal Canyon Rd.	TS	0	0	0	0	1	1	0	2	1>>	1	1	0	20.0	35.0	C	D
3	Temescal Canyon Rd. & Trilogy Pkwy.	TS	1	1	0	0	1	1	1	0	1	0	0	0	8.5	11.6	A	B
4	Campbell Ranch Rd. & Temescal Canyon Rd.	TS	1	0	1	0	0	0	0	1	1	1	1	0	28.5	18.0	C	B
5	I-15 NB Ramps & Weirick Rd.	TS	0	1	2	0	0	0	2	1	0	0	2	1	16.5	17.1	B	B
6	I-15 NB Ramps & Temescal Canyon Rd.	TS	0	1	0	0	0	0	1	2	0	0	2	1	26.0	17.7	C	B
7	Temescal Canyon Rd. & Dos Lagos Dr.	TS	1	2	0	1	1	1>>	2	0	1>	0	0	0	16.0	16.7	B	B
8	Temescal Canyon Rd. & Dawson Canyon Rd.	TS	1	1	0	1	1	0	0	1	0	0	1	0	38.3	9.1	D	A
9	Temescal Canyon Rd. & Driveway 1		Future Intersection															
10	Temescal Canyon Rd. & Driveway 2		Future Intersection															
11	Temescal Canyon Rd. & Driveway 3		Future Intersection															
12	Driveway 4 & Dawson Canyon Rd.		Future Intersection															
13	Driveway 5 & Dawson Canyon Rd.		Future Intersection															
14	Dawson Canyon Rd. & Dawson Canyon Rd.	CSS	0	1	0	0	0	0	0	1	1	0	1	0	11.2	11.0	B	B
15	Dawson Canyon Rd. & Driveway 6		Future Intersection															
16	Dawson Canyon Rd. & Driveway 7		Future Intersection															

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane

2 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

3 CSS = Cross-street Stop; TS = Traffic Signal

3.10 EXISTING (2020) OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway at Weirick Road and Temescal Canyon Road interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. This finding is consistent with field observations at the time traffic counts were conducted. Worksheets for Existing (2020) traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

3.11 EXISTING (2020) FREEWAY FACILITY ANALYSIS

Existing (2020) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-13. As shown in Table 3-3, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are currently operating at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2020) traffic conditions. Existing (2020) freeway facility analysis worksheets are provided in Appendix 3.5.

3.12 RECOMMENDED IMPROVEMENTS

3.12.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All existing study area intersections currently operate at an acceptable LOS; therefore, no improvements are recommended for Existing (2020) traffic conditions.

3.12.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 3-2, there are currently no peak hour queuing issues at the I-15 Freeway and Weirick Road and Temescal Canyon Road interchanges for Existing (2020) traffic conditions. As such, no improvements have been recommended.

3.12.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

As shown previously in Table 3-3, there are no study area freeway mainline segments and ramp junctions that currently operate at an unacceptable LOS for Existing (2020) traffic conditions. As such, no improvements have been recommended.

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2020) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)			
			95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Weirick Rd.	SBL/T	360	316	141	Yes	Yes
	SBR	1,260	40	46	Yes	Yes
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T	1,330	145	75	Yes	Yes
	SBR	530	85	83	Yes	Yes
I-15 NB Ramps & Weirick Rd.	NBL/T	390	13	43	Yes	Yes
	NBR	1,250	24	29	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T/R	1,340	769 [2]	115	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.
[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Table 3-3

Freeway Facility Analysis for Existing (2020) Conditions

Freeway	Direction[1]	Mainline Segment	Lanes[2]	Density[3]		LOS[4]	
				AM	PM	AM	PM
I-15	SB	North of Weirick Rd.	3	20.6	30.9	C	D
		Off-Ramp at Weirick Rd.	3	25.7	32.4	C	D
		On-Ramp at Weirick Rd.	3	18.3	28.5	B	D
		Between Weirick Rd. and Temescal Canyon Rd.	3	17.5	29.0	B	D
		Off-Ramp at Temescal Canyon Rd.	3	20.1	29.0	C	D
		On-Ramp at Temescal Canyon Rd.	3	17.5	28.8	B	D
		South of Temescal Canyon Rd.	3	15.9	28.3	B	D
	NB	North of Weirick Rd.	3	24.5	22.0	C	C
		On-Ramp at Weirick Rd.	3	26.7	23.8	C	C
		Off-Ramp at Weirick Rd.	3	22.9	22.6	C	C
		Between Weirick Rd. and Temescal Canyon Rd.	3	19.1	18.7	C	C
		On-Ramp at Temescal Canyon Rd.	3	20.3	19.7	C	B
		Off-Ramp at Temescal Canyon Rd.	3	24.0	19.8	C	B
		South of Temescal Canyon Rd.	3	20.2	17.1	C	B

[*] **BOLD** = Unacceptable Level of Service

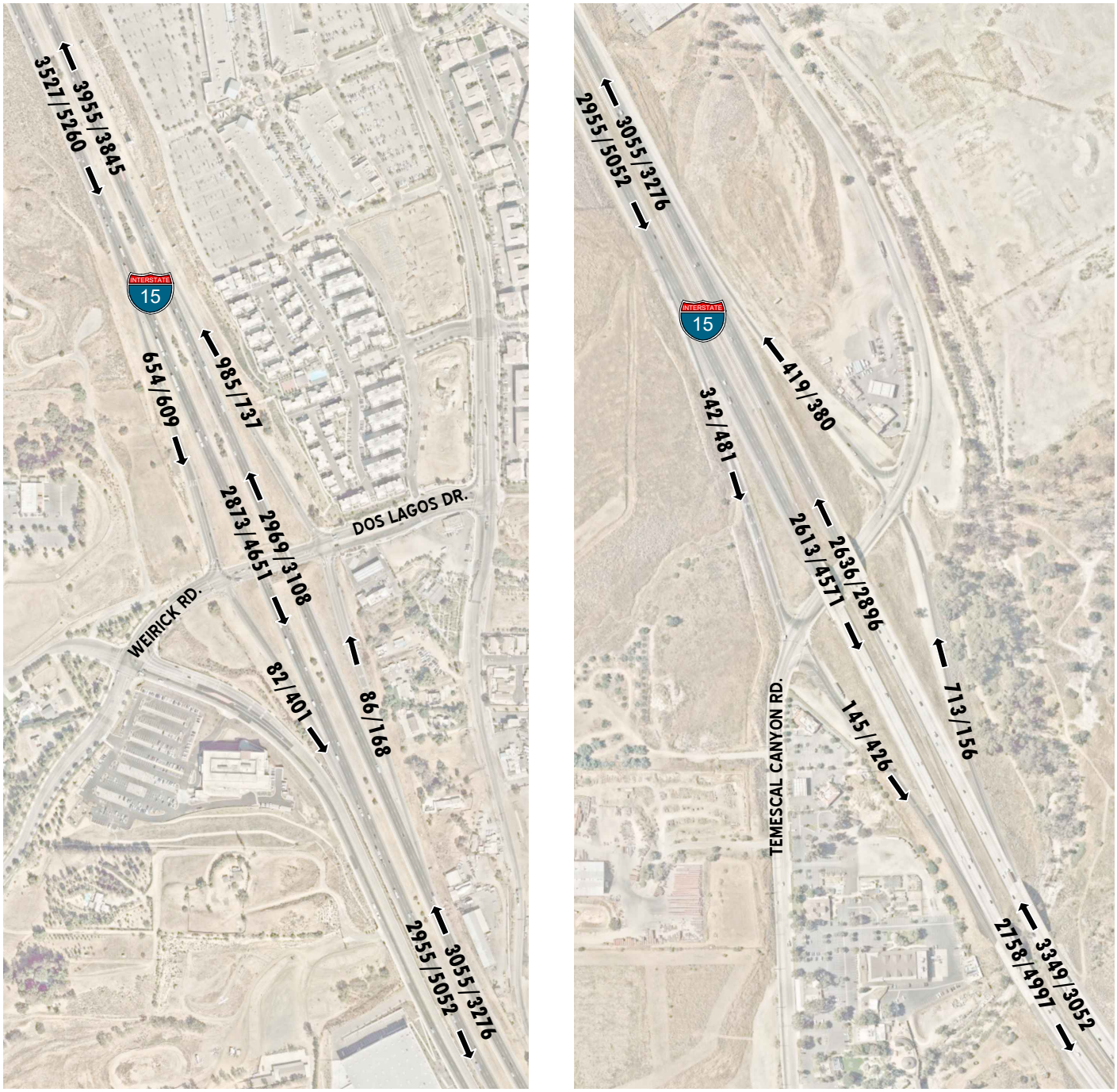
[1] NB = Northbound; SB = Southbound

[2] Number of lanes are in the specified direction and is based on existing conditions.

[3] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[4] LOS = Level of Service

EXHIBIT 3-13: EXISTING (2020) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of the development of a 183,456 square foot warehouse. Regional access to the Project site is available from the I-15 Freeway via Weirick Road and Temescal Canyon Road.

4.1 PROJECT TRIP GENERATION

4.1.1 TYPICAL OPERATIONS

Delivery stations operate 24/7 to support delivery of packages to at customer locations between 11:00 AM and 9:00 PM. The proposed Project anticipates approximately 21-line haul trucks delivering packages to the delivery station each day, primarily between the hours of 10:00 PM to 8:00 AM. The customer packages are sorted, picked to the delivery routes, placed onto movable racks, and staged for dispatch. Approximately 81 associates and 21 managers support this operation, and the shift structure is designed between 2:00 AM and 12:30 PM in order to reduce traffic during morning and evening peak periods. Additionally, there will be approximately 32 managers and dispatchers supervising the delivery operations, arriving at 6:00 AM and departing at 2:30 PM followed by another shift of dispatchers arriving at 1:30 PM and departing at 10:00 PM.

The delivery associates arrive at a delivery station at 9:20 AM. Starting at 9:50 AM and ending at 11:10 AM, 230 delivery vans will load and depart from the delivery station at a rate of 75 vans every 20 minutes to facilitate a regulated traffic flow into the surrounding area. The 1st wave of delivery vans leaves at 10:10 AM. The departure window is designed to reduce traffic from the Project on the adjacent roads during the morning and evening peak periods. Approximately 8-10 hours after dispatch, delivery routes are completed, and the vans return to the station between 7:10 PM and 9:10 PM. The drivers park the delivery van onsite and leave using a personal vehicle or public transport.

The Project anticipates approximately 60 traditional passenger vehicles entering the facility staggered between 4:30 PM and 6:00 PM for additional deliveries. These vehicles will load and depart every 15 minutes. Approximately 31 associates will work in the delivery station between 12:00 PM and 10:30 PM to support the delivery vehicles as they return to the station. After the check out and release of all delivery vehicles by 9:40 PM, delivery station associates prepare the delivery station for the next day's packages.

4.1.2 PEAK SEASON OPERATIONS

Delivery stations operate 24/7 to support delivery of packages to at customer locations between 7:00 AM and 9:00 PM. The proposed Project anticipates approximately 48-line haul trucks delivering packages to the delivery station each day, primarily between the hours of 6:00 PM to 7:00 AM. Approximately 172 associates and 15 managers support this operation, and the shift structure is designed between 2:00 AM and 12:30 PM in order to reduce traffic during morning and evening peak periods. Additionally, there will be approximately 32 managers and dispatchers

supervising the delivery operations, arriving at 6:00 AM and departing at 2:30 PM followed by another shift of dispatchers arriving at 1:30 PM and departing at 10:00 PM.

The delivery associates arrive at a delivery station at 6:30 AM. Starting at 6:30 AM and ending at 8:00 AM, 188 delivery vans will load and depart from the delivery station at a rate of 75 vans every 20 minutes to facilitate a regulated traffic flow into the surrounding area. The 1st wave of delivery vans leaves at 7:00 AM. Starting at 9:00 AM and ending at 11:00 AM, 412 delivery vans will load and depart from the delivery station at a rate of 75-150 vans every 20 minutes to facilitate a regulated traffic flow into the surrounding area. The 2nd wave of delivery vans leaves at 10:00 AM. Approximately 9-12 hours after dispatch, delivery routes are completed, and the vans return to the station between 4:10 PM and 9:30 PM. The drivers park the delivery van onsite and leave using a personal vehicle or public transport.

The Project anticipates approximately 60 traditional passenger vehicles entering the facility staggered between 4:00 PM and 5:30 PM for additional deliveries. These vehicles will load and depart every 15 minutes. Approximately 32 associates will work in the delivery station between 12:00 PM and 10:30 PM to support the delivery vehicles as they return to the station. After the check out and release of all delivery vehicles by 9:40 PM, delivery station associates prepare the delivery station for the next day's packages.

The peak season typically occurs between Thanksgiving and Christmas (approximately a 6-week period in a calendar year). Based on discussions with the County, 85 percent of the peak seasonal data is proposed to be utilized for the purposes of the LOS-based traffic study in an effort to conduct a conservative analysis (as opposed to using the typical operations).

4.1.3 TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development and is based upon the specific land uses planned for a given project. In order to develop the traffic characteristics of the proposed project, trip-generation information has been provided by the proposed tenant based on the anticipated operations of the facility. The proposed tenant/operator currently has many other similar facilities operating throughout the United States. The peak seasonal data used for the purposes of developing the Project's trip generation is provided in Appendix 4.1.

Passenger car equivalent (PCE) factors were applied to the trip generation rates for heavy trucks (large 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factor of 3.0 is consistent with the recommended PCE factor in Appendix B of the San Bernardino County Congestion Management Program (CMP) (2016 Update), as this factor is more conservative than Riverside County's PCE factor of 2.0 for heavy trucks.

Table 4-1 summarizes the peak seasonal data based on the information provided in Attachment A. Pursuant to discussions with County staff, 85% of the peak season will be evaluated for the purposes of the traffic study. As shown on Table 4-2, the proposed Project (85% of the peak season) is anticipated to generate a total of 3,016 actual vehicle trip-ends per day with 205 AM peak hour trips and 388 PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions, or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered to identify the route where the Project traffic would distribute.

The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for passenger cars/delivery vans, and truck traffic and are consistent with other similar projects that have been reviewed and approved by County of Riverside staff. The Project trip distribution patterns for warehouse passenger cars and trucks were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system. Each of these distribution patterns were reviewed by the County of Riverside as part of the traffic study scoping process (see Appendix 1.1).

It is assumed that the Serrano Specific Plan would construct the future Temescal Canyon Road extension along the northeast side of the I-15 Freeway. However, the Project may be built and operational before the Serrano Specific Plan submits an implementing project. As such, the operations analysis considers both with and without the future Temescal Canyon Road extension. Trip distribution patterns are shown on the following exhibits:

- Exhibit 4-1: Trucks "Without and With Temescal Canyon Road Extension"
- Exhibit 4-2: Passenger Cars "Without Temescal Canyon Road Extension"
- Exhibit 4-3: Passenger Cars "With Temescal Canyon Road Extension"

Table 4-1

Project Trip Generation Summary (Peak Season)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Summary (Actual)									
Delivery Station	183.456	TSF							
Warehouse Employees:			0	0	0	183	0	183	932
Drivers:			88	150	238	133	135	268	2,520
Passenger Cars (Subtotal):			88	150	238	316	135	451	3,452
Truck Trips (Line Haul, 4+-Axle):			1	2	3	2	3	5	96
TOTAL TRIPS (Actual Vehicles) [2]			**89**	**152**	**241**	**318**	**138**	**456**	**3,548**
Project Trip Generation Summary (PCE)									
Delivery Station	183.456	TSF							
Warehouse Employees:			0	0	0	183	0	183	932
Drivers:			88	150	238	133	135	268	2,520
Passenger Cars (Subtotal):			88	150	238	316	135	451	3,452
Truck Trips (Line Haul, 4+-Axle, PCE):			3	6	9	6	9	15	288
TOTAL TRIPS (PCE) [2]			**91**	**156**	**247**	**322**	**144**	**466**	**3,740**

[1] TSF = thousand square feet

[2] TOTAL TRIPS = Passenger Cars + Truck Trips.

Table 4-2

Project Trip Generation Summary (85% of the Peak Season)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Summary (Actual)									
Delivery Station	183.456	TSF							
Warehouse Employees:			0	0	0	156	0	156	792
Drivers:			75	128	202	113	115	228	2,142
Passenger Cars (Subtotal):			75	128	202	269	115	383	2,934
Truck Trips (Line Haul, 4+-Axle):			1	2	3	2	3	5	82
TOTAL TRIPS (Actual Vehicles) [2]			**76**	**129**	**205**	**271**	**118**	**388**	**3,016**
Project Trip Generation Summary (PCE)									
Delivery Station	183.456	TSF							
Warehouse Employees:			0	0	0	156	0	156	792
Drivers:			75	128	202	113	115	228	2,142
Passenger Cars (Subtotal):			75	128	202	269	115	383	2,934
Truck Trips (Line Haul, 4+-Axle, PCE):			3	5	8	6	9	15	246
TOTAL TRIPS (PCE) [2]			**77**	**133**	**210**	**275**	**124**	**398**	**3,180**

[1] TSF = thousand square feet

[2] TOTAL TRIPS = Passenger Cars + Truck Trips.

4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking, or bicycling have not been considered in this TA. Essentially, the traffic projections are "conservative" in that these alternative travel modes might be able to reduce the forecasted traffic volumes (employee trips only).

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes for “Without Temescal Canyon Road Extension” in PCE are shown on Exhibits 4-4 and 4-5, respectively. Project ADT and peak hour intersection turning movement volumes for “With Temescal Canyon Road Extension” in PCE are shown on Exhibits 4-6 and 4-7, respectively.

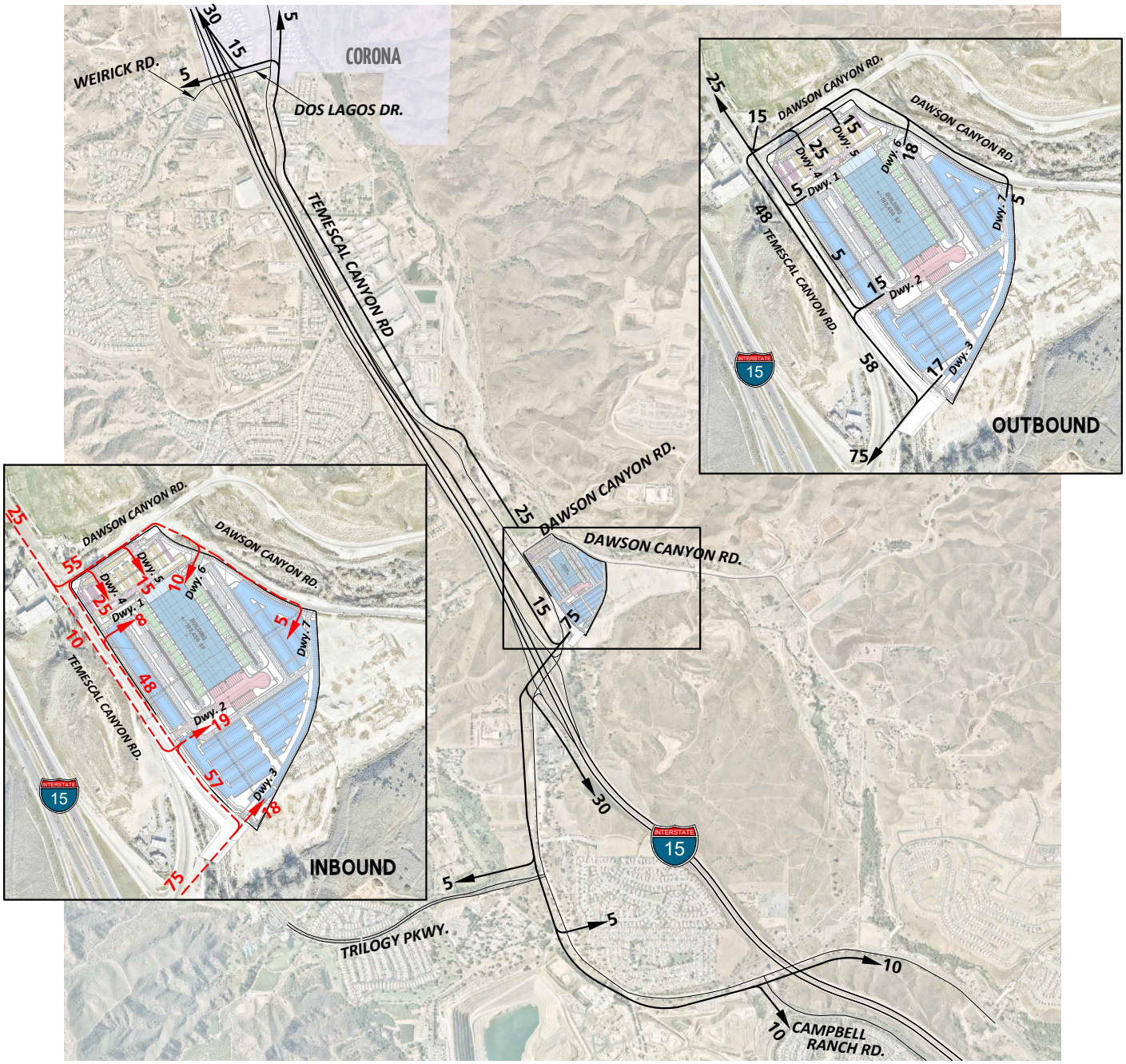
EXHIBIT 4-1: PROJECT (TRUCK WITHOUT AND WITH TEMESCAL CANYON ROAD EXTENSION) TRIP DISTRIBUTION

LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4-2: PROJECT (PASSENGER CAR WITHOUT TEMESCAL CANYON ROAD EXTENSION) TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

- - → = INBOUND

N

EXISTING TEMESCAL CANYON ROAD ALIGNMENT

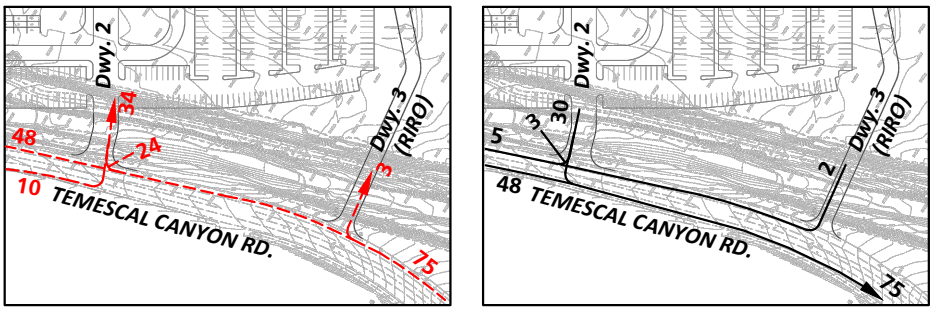
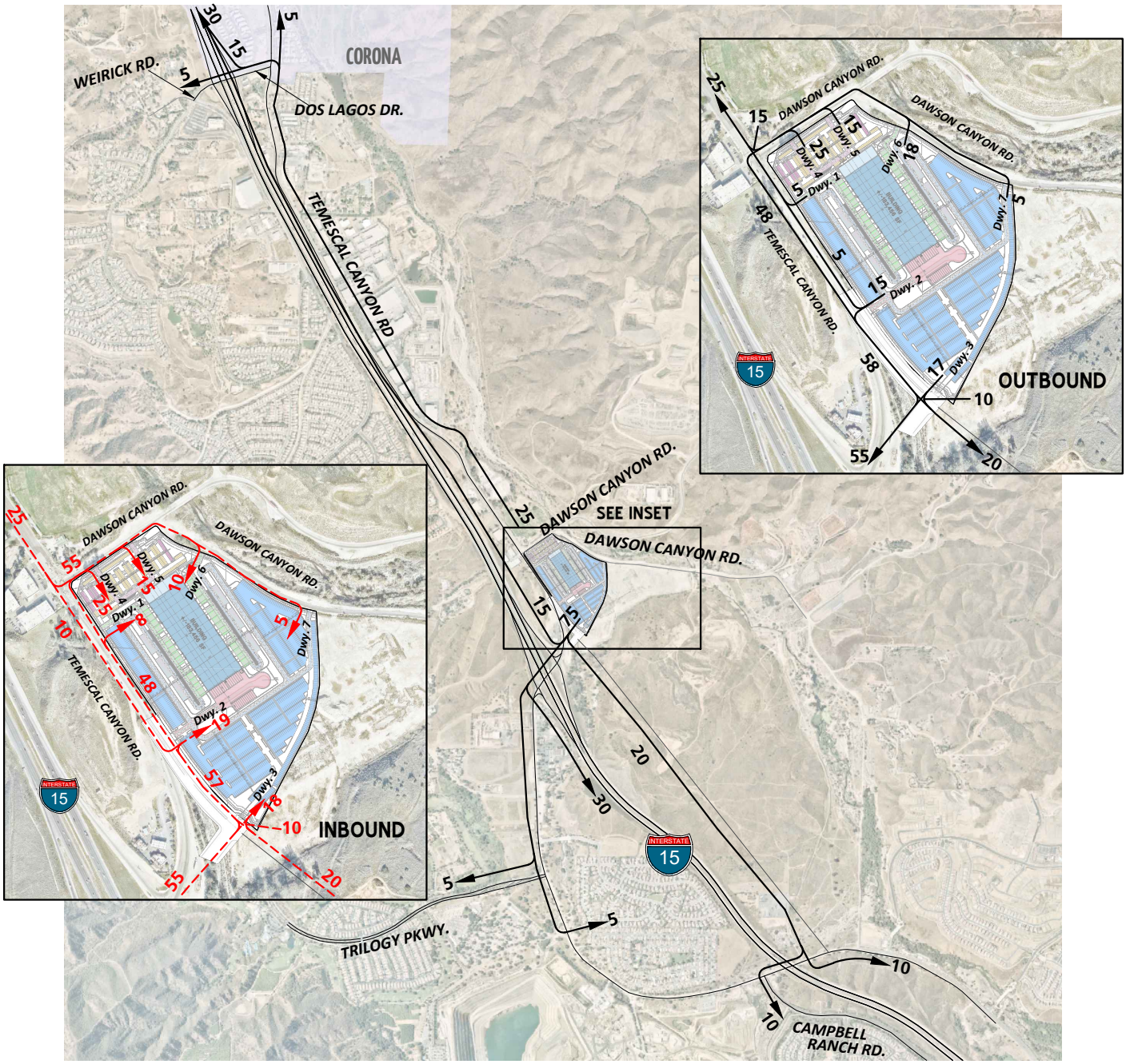


EXHIBIT 4-3: PROJECT (PASSENGER CAR WITH TEMESCAL CANYON ROAD EXTENSION) TRIP DISTRIBUTION



LEGEND:

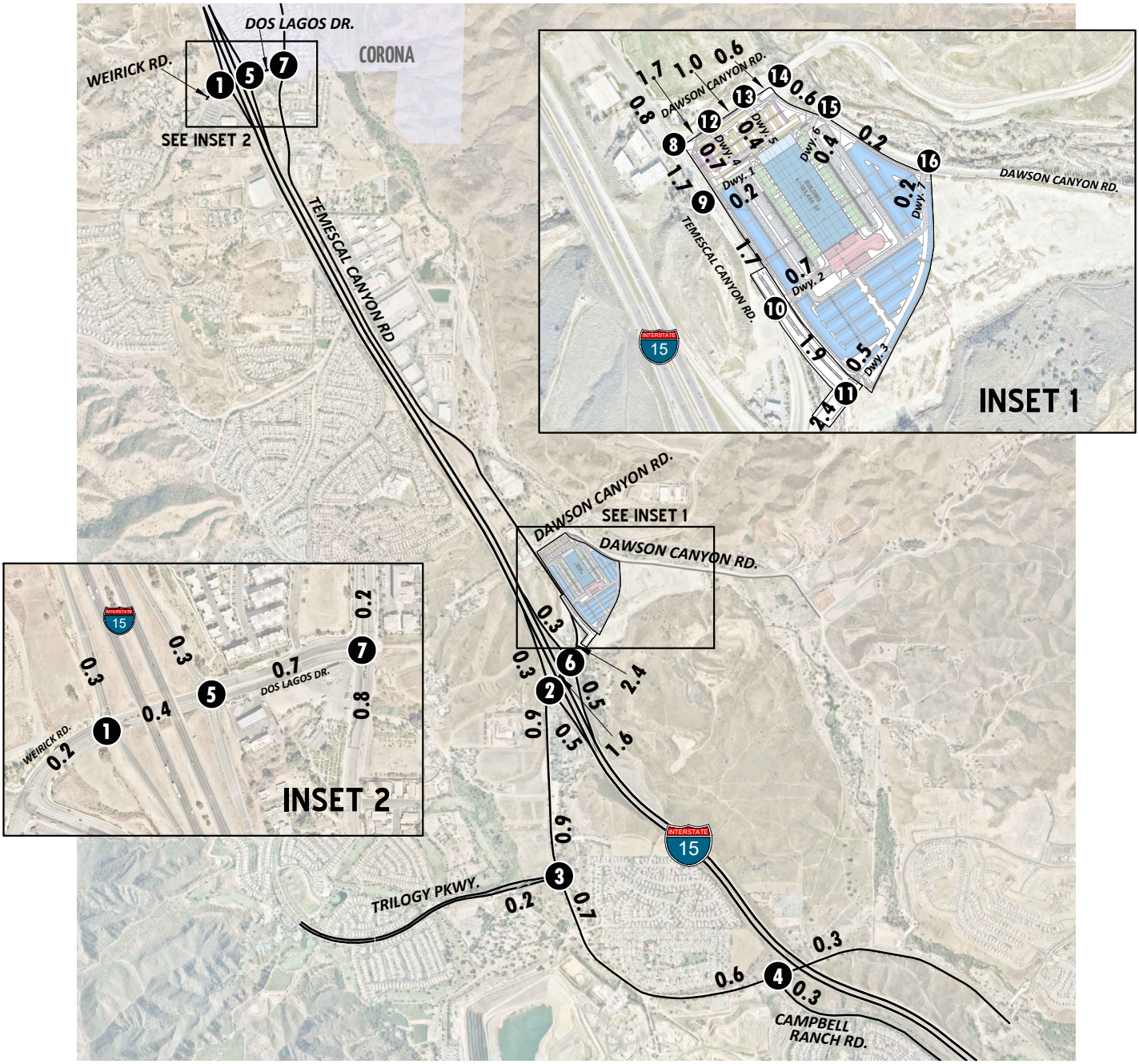
10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

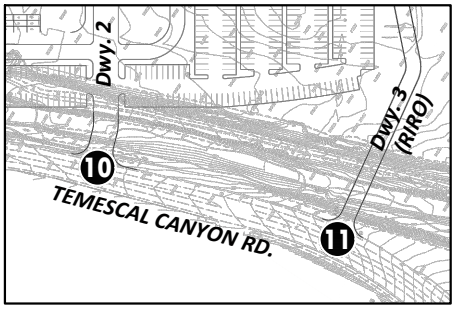
← - - - = INBOUND

N

EXHIBIT 4-4: PROJECT ONLY WITHOUT TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



EXISTING TEMESCAL CANYON ROAD ALIGNMENT



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-5: PROJECT ONLY WITHOUT TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)

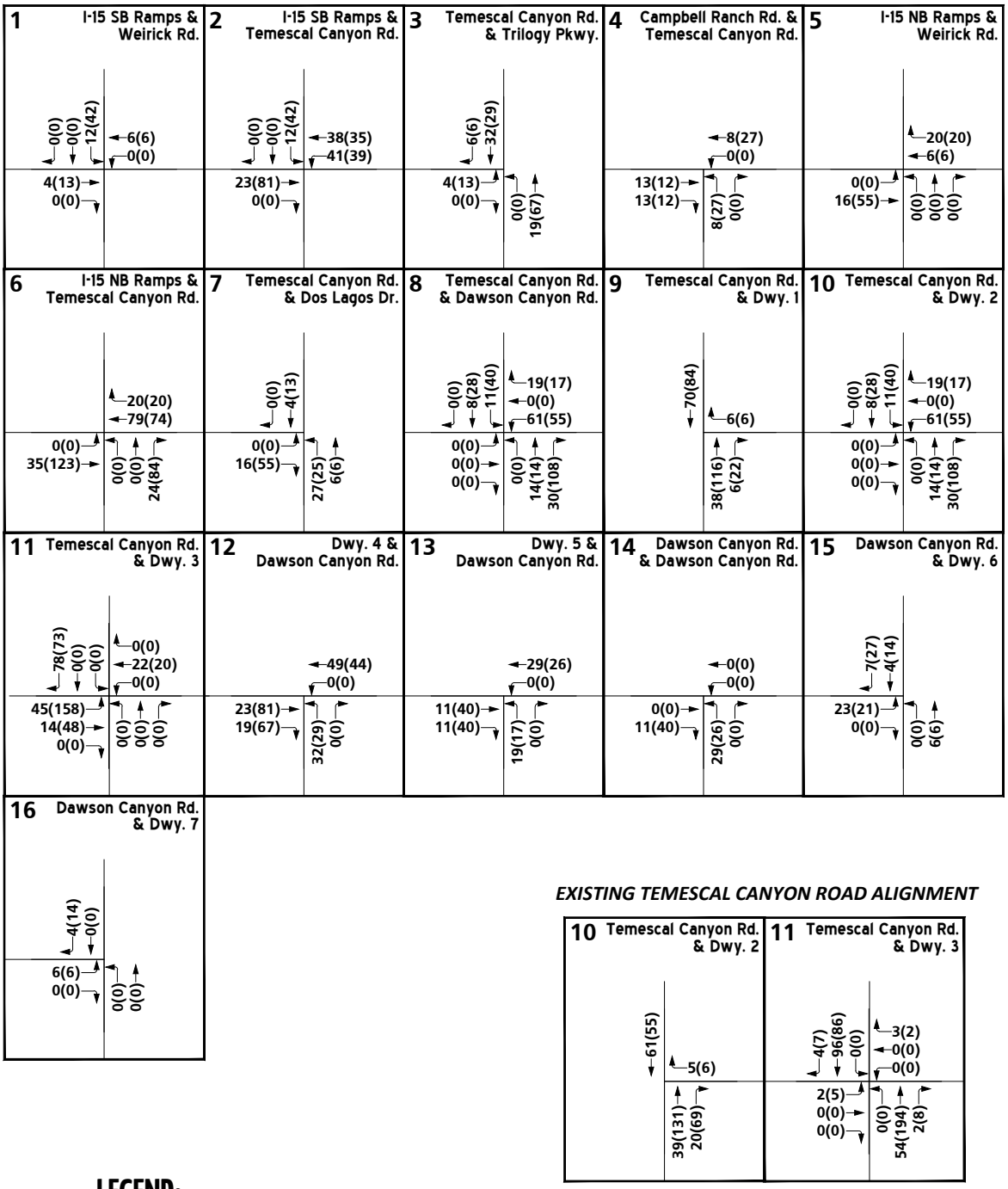
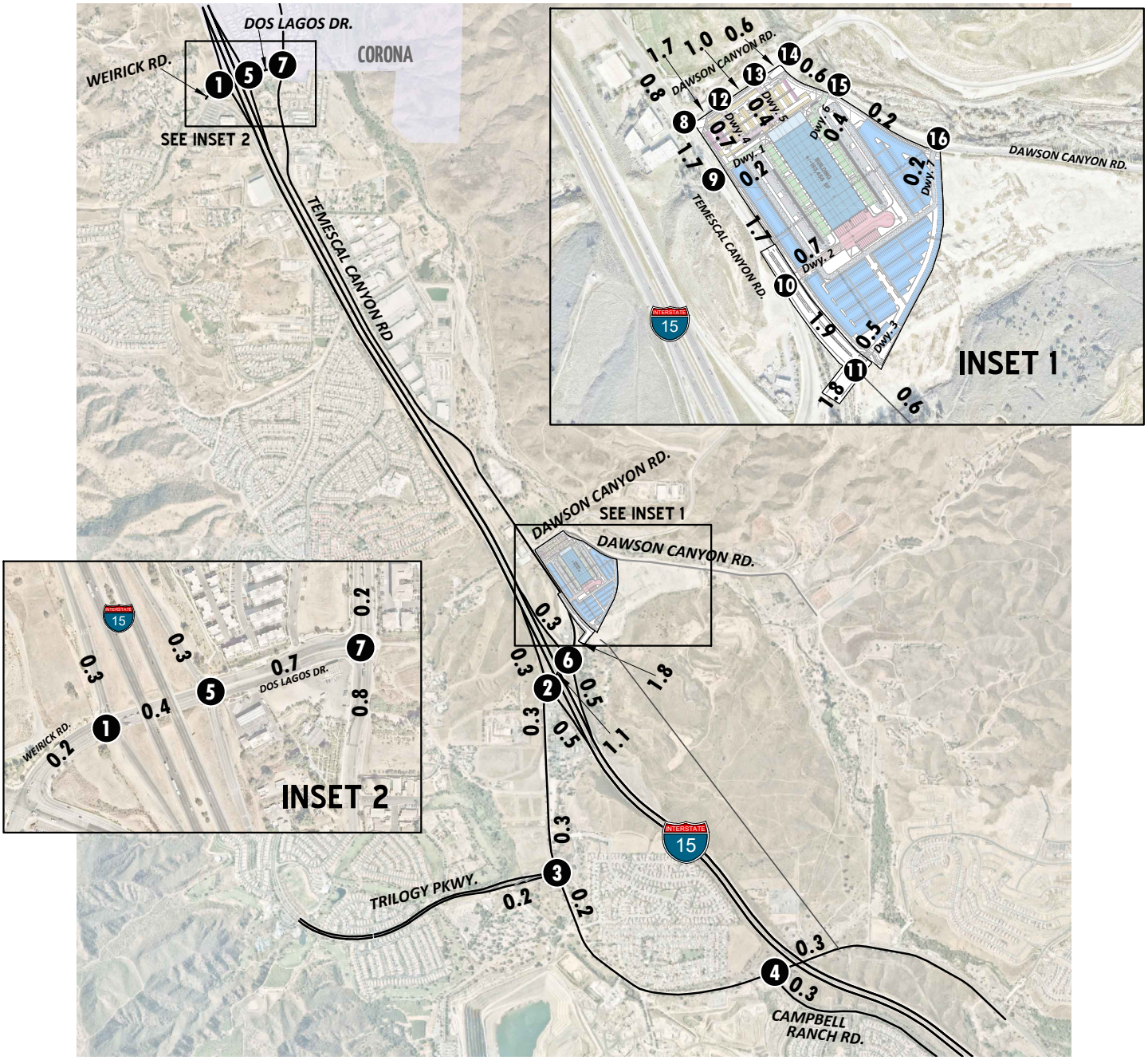


EXHIBIT 4-6: PROJECT ONLY WITH TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



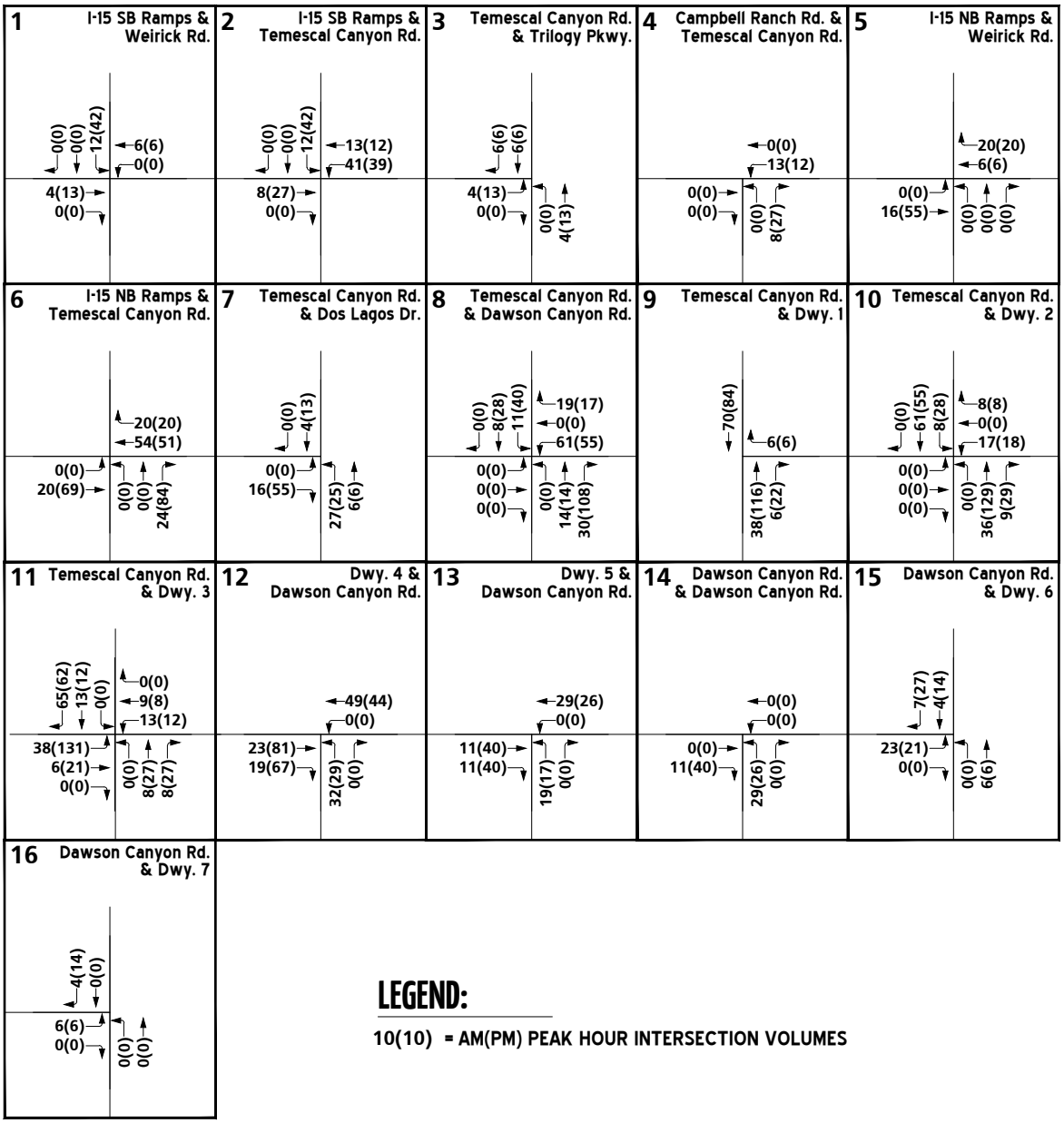
LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

13627 - adt-a.dwg

EXHIBIT 4-7: PROJECT ONLY WITH TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year for 2022 traffic conditions. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 4.04% for 2022 traffic conditions (compounded growth of 2 percent per year over 2 years). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects.

Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (September 2020) growth forecasts for the County of Riverside identifies projected growth in population of 370,500 in 2016 to 525,600 in 2045, or a 41.9 percent increase over the 29-year period. (10) The change in population equates to roughly a 1.21 percent growth rate, compounded annually. Similarly, growth over the same 29-year period in households is projected to increase by 59.2 percent, or 1.62 percent annual growth rate. Finally, growth in employment over the same 29-year period is projected to increase by 83.4 percent, or a 2.11 percent annual growth rate.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the County of Riverside. The cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e., 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate EAPC forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-8, listed in Table 4-3, and have been considered for inclusion.

Although it is unlikely that all of these cumulative projects would be fully built and occupied by Year 2022, they have been included in an effort to conduct a conservative analysis and overstate as opposed to understate potential traffic deficiencies.

EXHIBIT 4-8: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

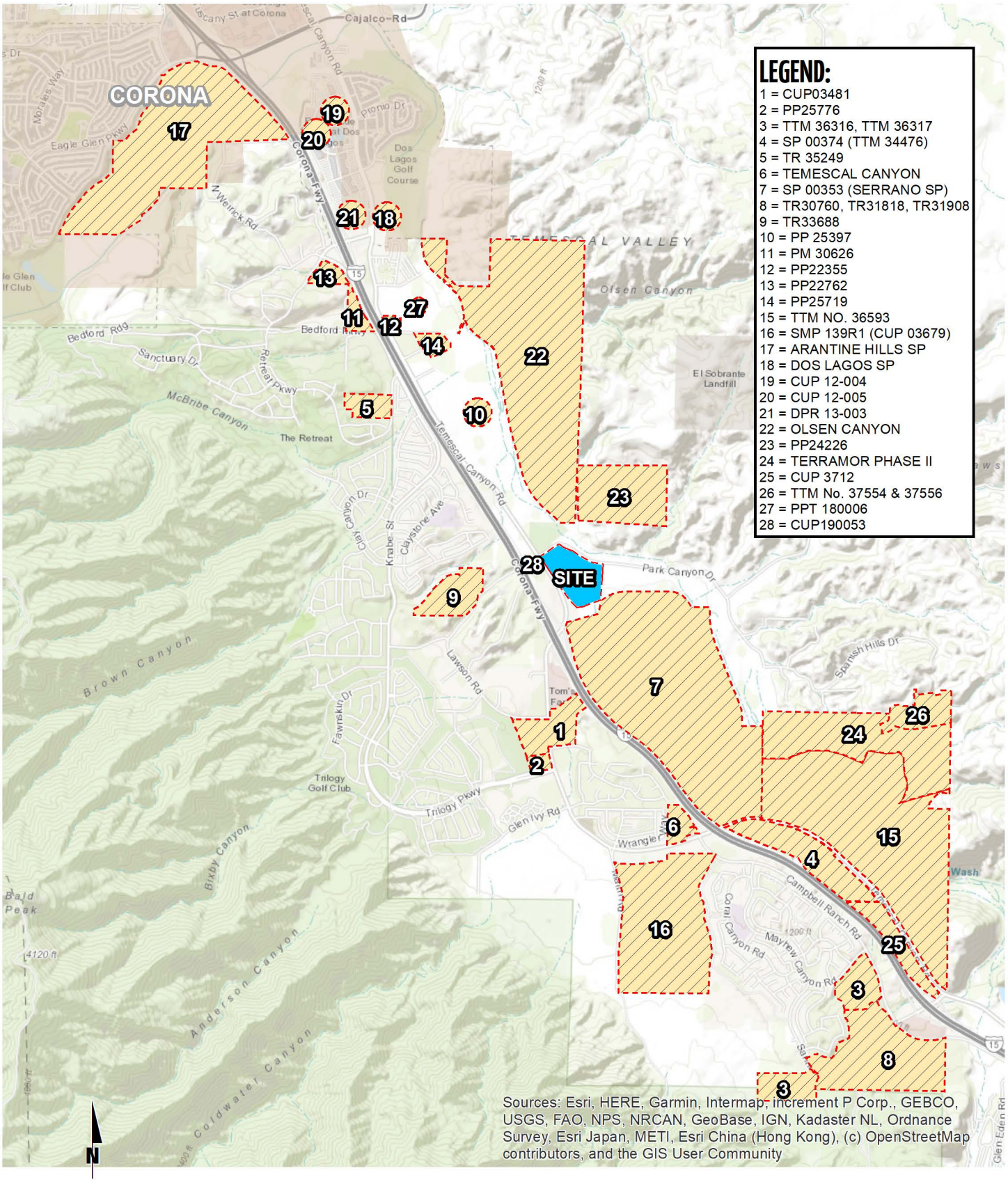


Table 4-3

Cumulative Development Land Use Summary

#	Project Name	Land Use	Quantity	Units[1]
1	CUP03481	Shopping Center	480.000	TSF
2	PP25776	Church	49.000	TSF
		Private School	216	STU
		Pre-School	96	STU
3	TTM No. 36316	Single Family Residential	87	DU
	TTM No. 36317	Single Family Residential	194	DU
		Passive Park	14.5	AC
		Passive Park	3.9	AC
4	Specific Plan No. 00374 (TTM No. 34476)[2]	Fast Food w/ Drive Thru	3.500	TSF
		Business Park	476.150	TSF
		High Turnover Restaurant	13.460	TSF
		Daycare Center	10.000	TSF
		Hotel	320	ROOMS
		Shopping Center	117.740	TSF
		General Office	103.300	TSF
		Mini-Warehouse	381	UNITS
5	TR 35249	SFDR	53	DU
6	PP26209	Multi-Family Residential	80	DU
7	Specific Plan No. 00353 (Serrano Specific Plan)[3]	Light Industrial	6,600.994	TSF
		Shopping Center	172.150	TSF
8	TR30760	Single Family Residential	285	DU
	TR31818	Single Family Residential	311	DU
		Community Park	11.65	AC
	TR31908	Single Family Residential	261	DU
9	TR33688	Single Family Residential	54	DU
10	PP 25397	Manufacturing	60.300	TSF
11	PM 30626	Business Park	8.7	AC
12	PP22355	Fast Food w/ Drive Thru	2.500	TSF
		Retail	30.214	TSF
13	PP22762	General Office	93.924	TSF
14	PP25719	General Light Industrial	84.892	TSF
15	Specific Plan No. 00327 (Toscana Phase I and Phase III)	SFDR	917	DU
		Active Park	8.1	AC
16	SMP 139R1 (CUP 03679)	Surface Mining	2.0	MTPY
17	Arantine Hills Specific Plan	Single Family Residential	549	DU
		Multi-Family Residential	1,072	DU
		Passive Park	4.0	AC
		Active Park	11.0	AC
		General Office	59.000	TSF
		Business Park	230.900	TSF
		Specialty Retail	59.000	TSF
		Shopping Center	396.400	TSF
18	Dos Lagos Specific Plan	Apartments (PA 1)	450	DU
19	CUP 12-004	Hotel	120	RM
20	CUP 12-005	Apartments	125	DU

Table 4-3

Cumulative Development Land Use Summary

#	Project Name	Land Use	Quantity	Units[1]
21	DPR 13-003	Apartments	354	DU
22	Olsen Canyon	Surface Mining	2.0	MTPY
23	PP24226 (Leinen Business Park)	Manufacturing	135.421	TSF
24	Toscana Phase 2	Single Family Residential	501	DU
		Active Park	5.0	AC
		Passive Park	0.9	AC
25	CUP 3712 (Phase 1 + Phase 2)	Gas Station w/ Market and Car Wash	12	DU
		Fast Food w/ Drive Thru	6.800	TSF
		High Turnover Restaurant	20.000	TSF
		General Office	56.000	TSF
		Shopping Center	46.900	TSF
		Supermarket	43.000	TSF
		Pharmacy w/ Drive Thru	14.000	TSF
		Bank w/ Drive Thru	3.500	TSF
26	TTM No. 37554 & 37556	Single Family Residential	143	DU
27	PPT180006	Warehousing	30.250	TSF
28	CUP190053	Marijuana Dispensary	8.582	TSF
29	Glen Ivy Senior Community	Assisted Living	165.000	Beds
		Senior Adult Housing - Attached	76.000	DU
30	SP 00387 (Lakeside)	Single Family Residential	410	DU
31	Glen Ivy Resort Expansion	Single Family Residential	62	DU
		Multi-Family Residential	203	DU
		Resort Hotel	210	RM
		Shopping Center	122.729	TSF
32	TR37027, TR37154 & TR37155	Single Family Residential	116	DU

[1] DU = Dwelling Units; TSF = Thousand Square Feet; AC = Acres; MTPY = Million Tons Per Year; STU = Students; RM = Room

[2] Land Use and Quantity Source: Specific Plan No. 00374 (TTM No. 34476) TIA, Urban Crossroads, Inc., August 18, 2008.

[3] Source: Serrano Commerce Center TIA, Kunzman Associates, November 20, 2008.

Any other cumulative projects located beyond the cumulative study area that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*.

As previously discussed in Section 4.2 *Project Trip Distribution*, the Serrano Specific Plan would construct the future Temescal Canyon Road extension. However, the Project may be built and operational before the Serrano Specific Plan submits an implementing project. As such, similar to the Project trip distributions, separate trip distributions have been utilized for the cumulative development projects within the study area, without and with the extension in place. Cumulative Only ADT and peak hour intersection turning movement volumes for "Without Temescal Canyon Road Extension" are shown Exhibits 4-9 and 4-10, respectively. Cumulative Only ADT and peak hour intersection turning movement volumes for "With Temescal Canyon Road Extension" are shown Exhibits 4-11 and 4-12, respectively.

4.7 NEAR-TERM TRAFFIC CONDITIONS

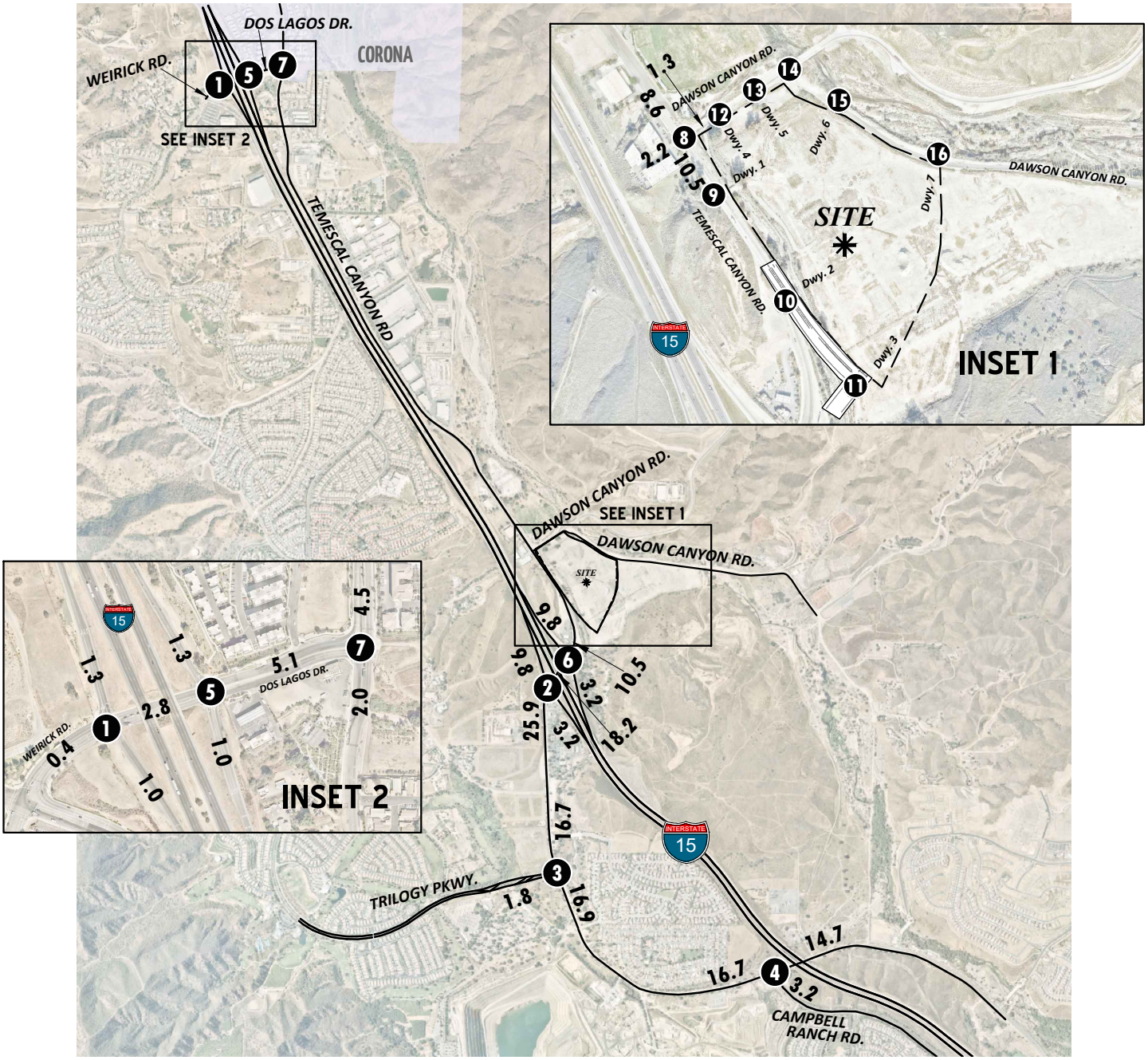
The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast EAP (2022) and EAPC (2022) traffic conditions. An ambient growth factor of 4.04% accounts for background (area-wide) traffic increases that occur over time up to the year 2022 from the year 2020 (2.0 percent per year growth rate, compounded over a 2-year period). Traffic volumes generated by the Project are then added to assess the near-term traffic conditions. The 2022 roadway network is similar to the Existing conditions roadway network, with the exception of future driveways proposed to be developed by the Project.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- Existing Plus Ambient Growth Plus Project (2022)
  - Existing 2020 counts
  - Ambient growth traffic (4.0%)
  - Project traffic

- Existing Plus Ambient Growth Plus Project Plus Cumulative (2022)
  - Existing 2020 counts
  - Ambient growth traffic (4.0%)
  - Cumulative Development traffic
  - Project traffic

EXHIBIT 4-9: CUMULATIVE ONLY WITHOUT TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-10: CUMULATIVE ONLY WITHOUT TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)

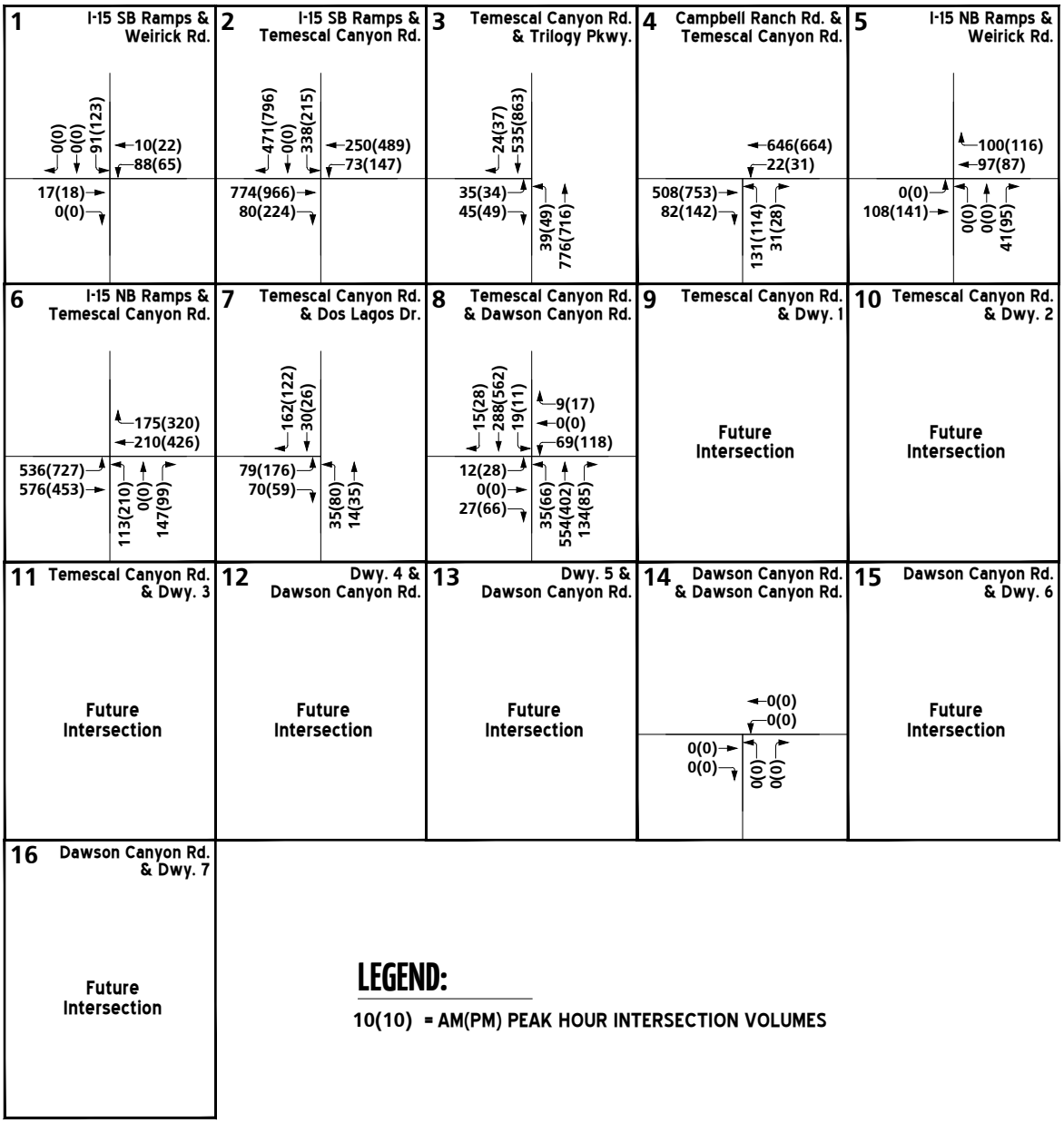
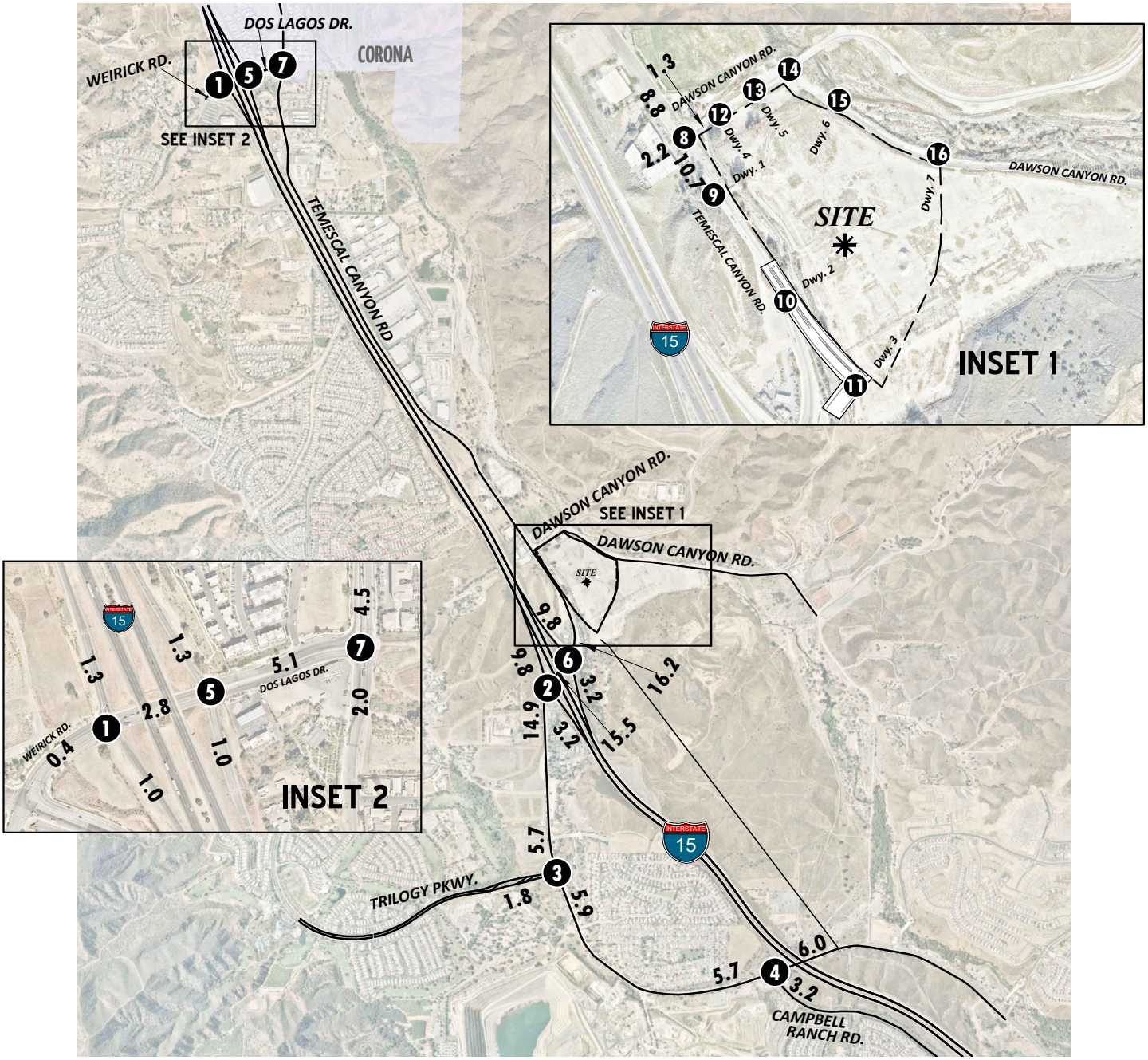


EXHIBIT 4-11: CUMULATIVE ONLY WITH TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

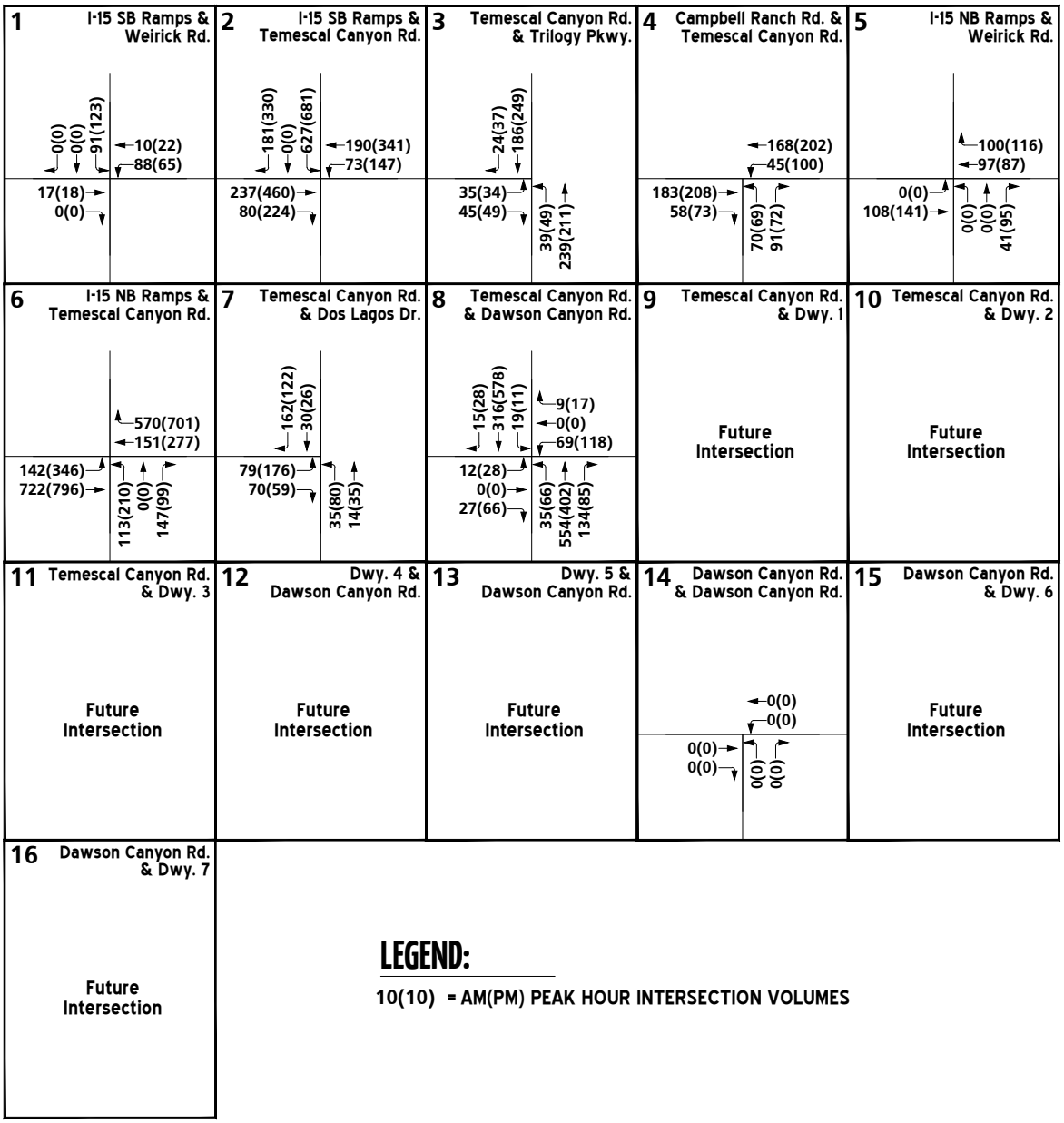


LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 4-12: CUMULATIVE ONLY WITH TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



4.8 HORIZON YEAR (2040) CONDITIONS

"Buildout" traffic projections for Horizon Year conditions are based on traffic model forecasts and were derived from the RivTAM using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of Riverside. The Horizon Year traffic conditions analyses was utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the TUMF, can accommodate the long-range traffic at the target LOS identified in the County of Riverside General Plan.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2020) conditions and Horizon Year (2040) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in November of 2019. The RivTAM has a base (validation) year of 2012 and a horizon (future forecast) year of 2040. The RivTAM 2040 model utilized for the purposes of this analysis assumes buildout of the County of Riverside.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 255), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent Horizon Year traffic conditions. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing, EAP, and EAPC traffic conditions were not assumed as part of this analysis. As such, in conjunction with the addition of cumulative projects that are not consistent with the General Plan, additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable Horizon Year forecasts. Horizon Year turning volumes were compared to EAPC (2022) volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between EAPC (2022) and Horizon Year (2040) traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing (2020) and EAPC (2022) conditions.

Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns (i.e., the future Temescal Canyon Road extension) to further refine the Horizon Year (2040) peak hour forecasts.

The future Horizon Year (2040) Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel

routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

RivTAM does not include a truck component or have data that is unusually low. As such, in an effort to conduct a conservative analysis, the presence of trucks has been accounted for based on the manual volume adjustments made to demonstrate growth above EAPC (2022) traffic forecasts, which are presented and evaluated in PCE (see Section 3.7 *Existing Traffic Counts* for discussion on PCE). As such, the Horizon Year (2040) forecasts are also assumed to be in PCE for the purposes of this analysis. Post-processing worksheets for Horizon Year (2040) Without Project traffic conditions are provided in Appendix 4.1.

5 EAP (2022) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAP (2022) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway facility operations analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP (2022) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

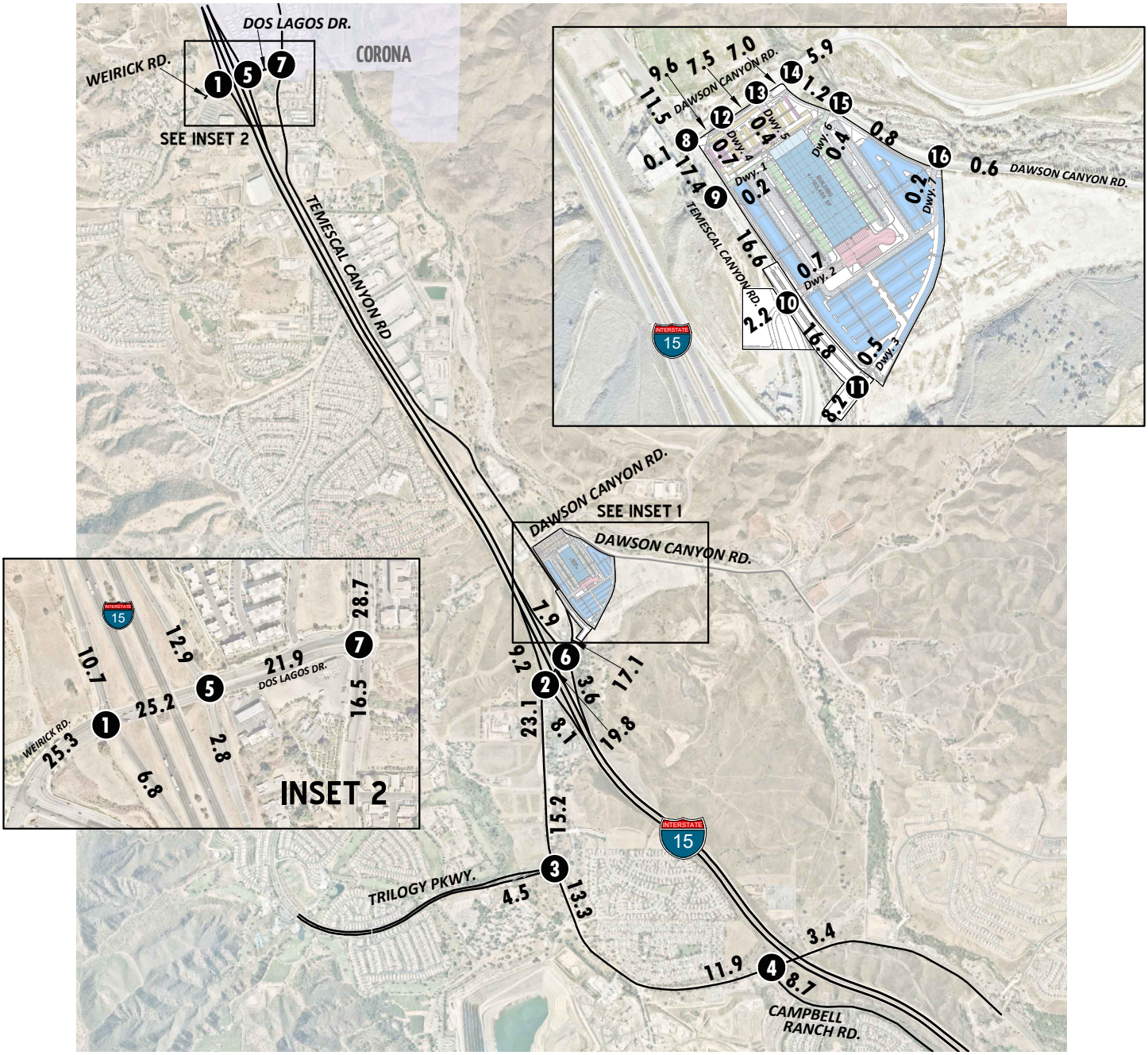
- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes the realignment of Temescal Canyon Road along the Project's frontage.
- The Temescal Canyon Road widening improvements (from Dos Lagos to I-15 interchange) are assumed to be completed.
- The Temescal Canyon Road extension is assumed to be in place for "With Temescal Canyon Road Extension" conditions only.

5.2 EAP (2022) TRAFFIC VOLUME FORECASTS

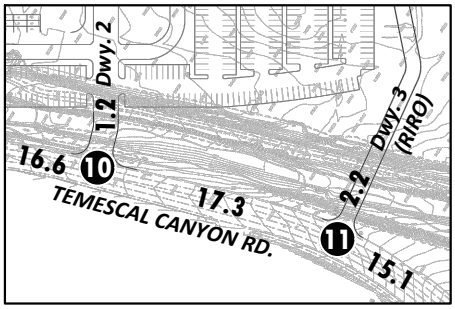
This scenario includes Existing (2020) traffic volumes plus an ambient growth factor of 4.04% and the addition of Project traffic. The weekday ADT and peak hour volumes (in PCE) which can be expected for EAP (2022) traffic conditions are shown on Exhibits 5-1 and 5-2, respectively. For Without Temescal Canyon Road Extension conditions, an alternative has been evaluated for Driveways 2 and 3 at Temescal Canyon Road that evaluates the existing alignment of Temescal Canyon Road and the alternative driveway access restrictions. The weekday ADT and peak hour volumes (in PCE) for the existing alignment alternative are also shown on Exhibits 5-1 and 5-2, respectively.

As previously discussed in Section 4.2 *Project Trip Distribution*, it is assumed that the Serrano Specific Plan will be constructing the future Temescal Canyon Road extension. However, the Project may be built and operational before the Serrano Specific Plan submits an implementing project. For the purposes of this TA, EAP (2022) traffic conditions has been evaluated for both Without and With Temescal Canyon Road Extension, in the event the Serrano Specific Plan does or does not submit an implementing project before the Project is built and operational, therefore constructing the future extension of Temescal Canyon Road. The weekday ADT volumes and peak hour volumes (in PCE) which can be expected for EAP (2022) With Temescal Canyon Road Extension traffic conditions are shown on Exhibits 5-3 and 5-4, respectively.

EXHIBIT 5-1: EAP (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



EXISTING TEMESCAL CANYON ROAD ALIGNMENT

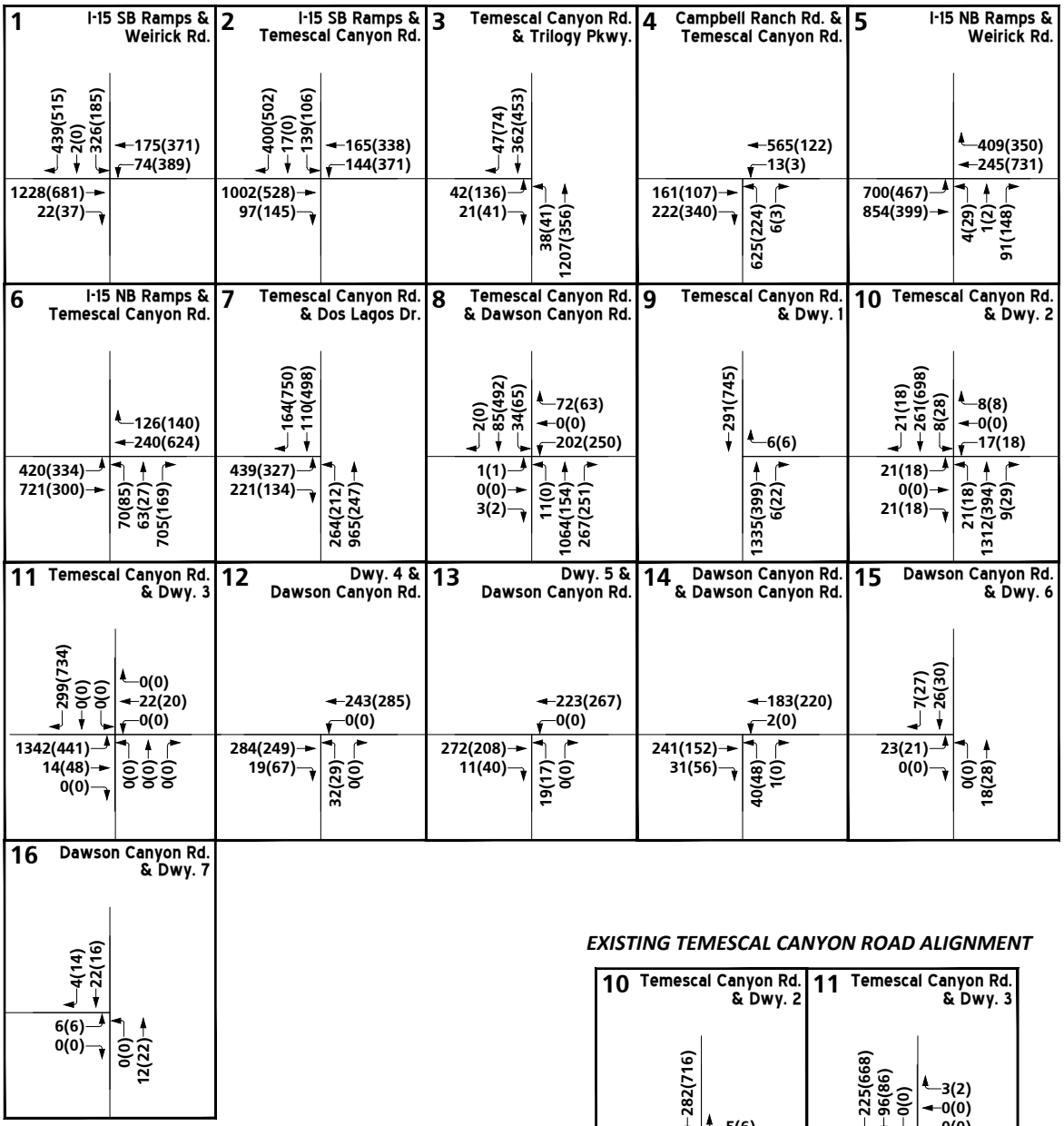


LEGEND:

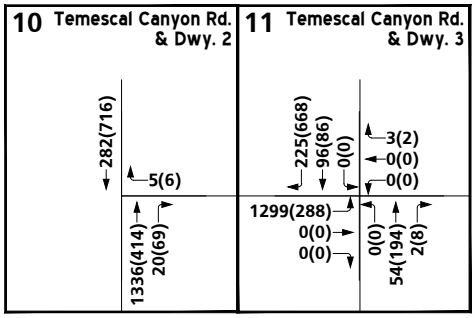
10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 5-2: EAP (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



EXISTING TEMESCAL CANYON ROAD ALIGNMENT

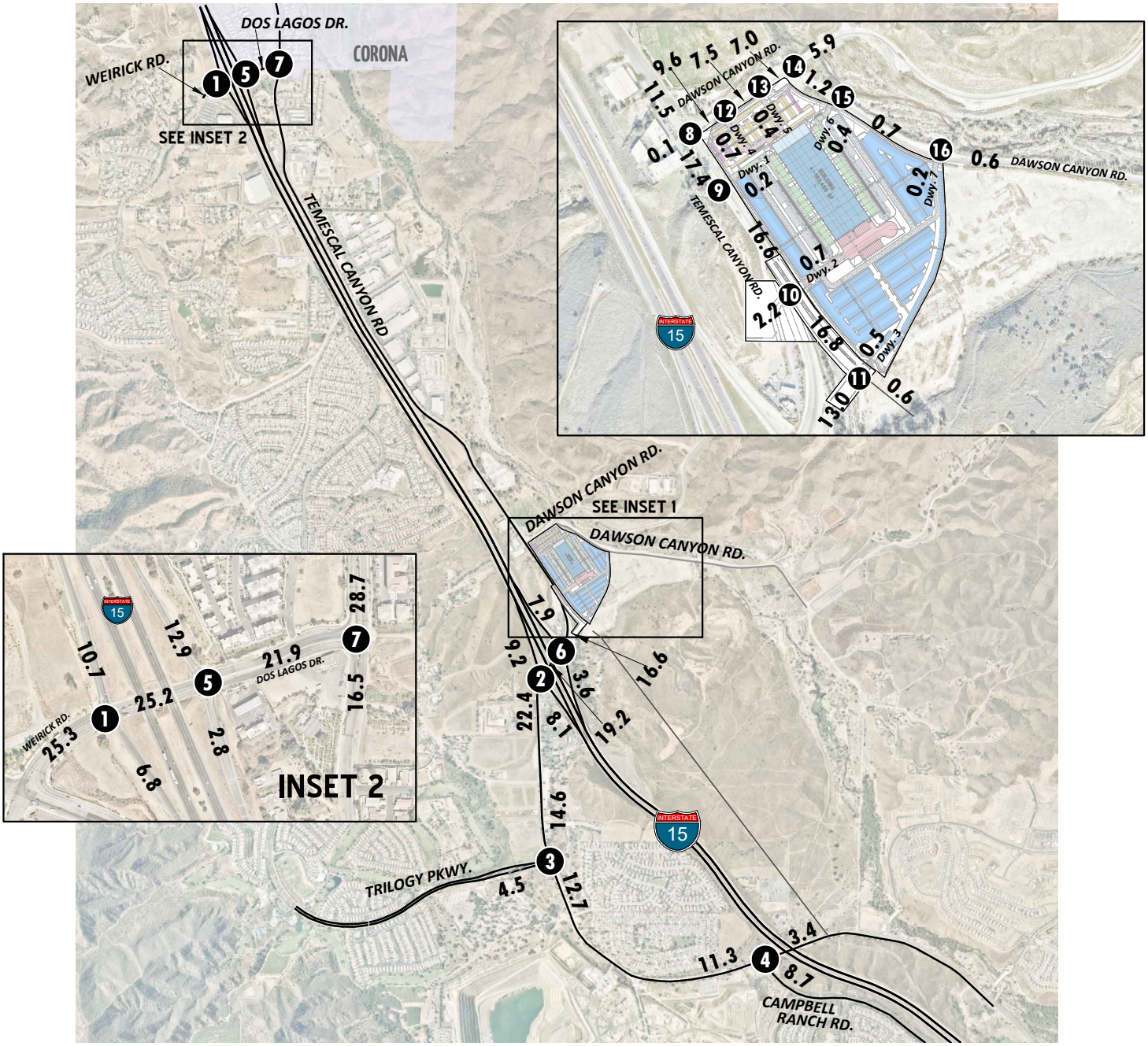


LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

N

EXHIBIT 5-3: EAP (2022) WITH TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

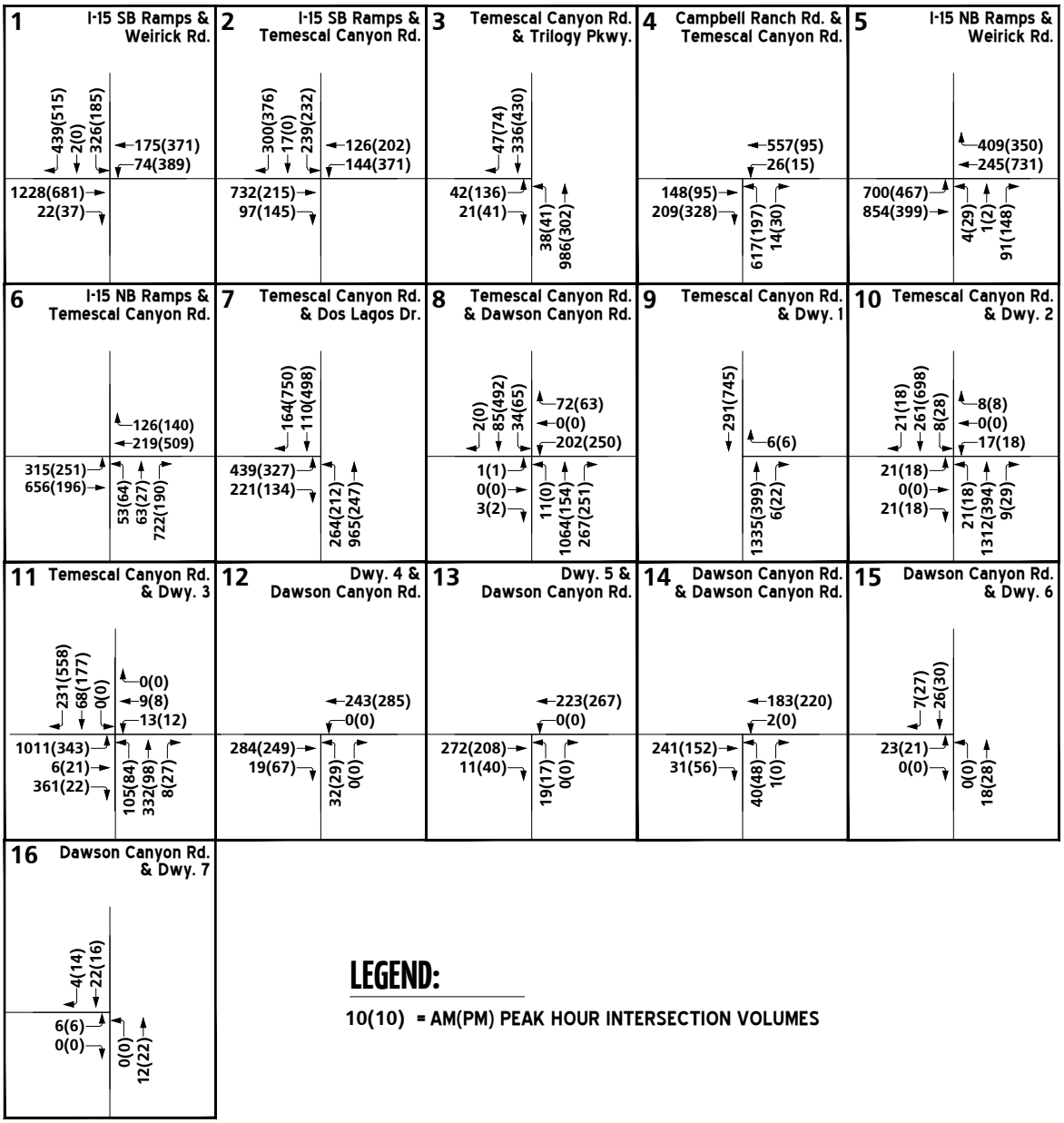


LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 5-4: EAP (2022) WITH TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



5.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 5-1, all study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours for EAP (2022) traffic conditions, consistent with Existing (2020) traffic conditions. Project Driveways 2 and 3 on Temescal Canyon Road are anticipated to operate at an acceptable LOS during the peak hours under the existing alignment of Temescal Canyon Road alternative. A summary of the peak hour intersection LOS for EAP (2022) Without Temescal Canyon Road Extension traffic conditions is shown on Exhibit 5-5. The intersection operations analysis worksheets for EAP (2022) Without Temescal Canyon Road Extension traffic conditions are included in Appendix 5.1 of this TA.

With the future extension of Temescal Canyon Road, the study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under EAP (2022) With Temescal Canyon Road Extension. A summary of the peak hour intersection LOS for EAP (2022) Without Temescal Canyon Road Extension traffic conditions is shown on Exhibit 5-6. The intersection operations analysis worksheets for EAP (2022) With Temescal Canyon Road Extension traffic conditions are included in Appendix 5.2 of this TA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EAP (2022) traffic conditions based on daily volumes. The following study area intersection is anticipated to meet planning-level ADT traffic signal warrants under EAP (2022) Without Temescal Canyon Road Extension traffic conditions (see Appendix 5.3):

- Temescal Canyon Road & Driveway 2
- Temescal Canyon Road & Driveway 3

There is no additional unsignalized study area intersections that are anticipated to meet a traffic signal warrant under EAP (2022) With Temescal Canyon Road Extension traffic conditions (see Appendix 5.4).

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway at Weirick Road and Temescal Canyon Road interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 5-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 5-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows, consistent with Existing (2020) traffic conditions. Worksheets for EAP (2022) Without and With Temescal Canyon Road Extension traffic conditions off-ramp queuing analysis are provided in Appendices 5.5 and 5.6, respectively.

Table 5-1

Intersection Analysis for EAP (2022) Conditions

#	Intersection	Traffic Control[2]	Existing (2020) Delay (sec)[1] AM	Existing (2020) Delay (sec)[1] PM	Existing (2020) Level of Service AM	Existing (2020) Level of Service PM	EAP (2022) Without Temescal Canyon Road Extension Delay (sec)[1] AM	EAP (2022) Without Temescal Canyon Road Extension Delay (sec)[1] PM	EAP (2022) Without Temescal Canyon Road Extension Level of Service AM	EAP (2022) Without Temescal Canyon Road Extension Level of Service PM	EAP (2022) With Temescal Canyon Road Extension Delay (sec)[1] AM	EAP (2022) With Temescal Canyon Road Extension Delay (sec)[1] PM	EAP (2022) With Temescal Canyon Road Extension Level of Service AM	EAP (2022) With Temescal Canyon Road Extension Level of Service PM
1	I-15 SB Ramps & Weirick Rd.	TS	20.9	25.7	C	C	22.1	26.8	C	C	22.1	26.8	C	C
2	I-15 SB Ramps & Temescal Canyon Rd.	TS	20.0	35.0	C	D	22.1	38.0	C	D	23.4	35.7	C	D
3	Temescal Canyon Rd. & Trilogy Pkwy.	TS	8.5	11.6	A	B	9.7	11.6	A	B	7.5	12.1	A	B
4	Campbell Ranch Rd. & Temescal Canyon Rd.	TS	28.5	18.0	C	B	30.1	18.0	C	B	29.8	18.3	C	B
5	I-15 NB Ramps & Weirick Rd.	TS	16.5	17.1	B	B	17.1	17.2	B	B	17.1	17.2	B	C
6	I-15 NB Ramps & Temescal Canyon Rd.	TS	26.0	17.7	C	B	30.0	19.4	C	B	27.6	19.2	C	B
7	Temescal Canyon Rd. & Dos Lagos Dr.	TS	16.0	16.7	B	B	17.9	18.3	B	B	17.9	18.3	B	B
8	Temescal Canyon Rd. & Dawson Canyon Rd.	TS	38.3	9.1	D	A	10.9	8.8	B	A	10.9	8.8	B	A
9	Temescal Canyon Rd. & Driveway 1	**CSS**	Future Intersection				14.9	9.7	B	A	14.9	9.7	B	A
10	Temescal Canyon Rd. & Driveway 2	**TS**	Future Intersection				8.9	9.0	A	A	8.9	9.0	A	A
	-With Existing Alignment	**TS**					7.3	6.2	A	A	Not Evaluated[3]			
11	Temescal Canyon Rd. & Driveway 3	**TS**	Future Intersection				18.4	21.6	B	C	21.5	21.5	C	C
	-With Existing Alignment	**CSS**					8.5	8.9	A	A	Not Evaluated[3]			
12	Driveway 4 & Dawson Canyon Rd.	**CSS**	Future Intersection				13.1	13.5	B	B	13.1	13.5	B	C
13	Driveway 5 & Dawson Canyon Rd.	**CSS**	Future Intersection				12.4	12.4	B	B	12.4	12.4	B	B
14	Dawson Canyon Rd. & Dawson Canyon Rd.	CSS	11.2	11.0	B	B	11.8	11.4	B	B	11.8	11.4	B	B
15	Dawson Canyon Rd. & Driveway 6	**CSS**	Future Intersection				8.8	9.0	A	A	8.8	9.0	A	A
16	Dawson Canyon Rd. & Driveway 7	**CSS**	Future Intersection				8.7	8.8	A	A	8.7	8.8	A	A

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

2 CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

3 The existing alignment of Temescal Canyon Road has been evaluated for Without Temescal Canyon Road Extension conditions only since the future Temescal Canyon Road extension will realign the roadway along the Project's frontage.

Table 5-2

Peak Hour Freeway Off-Ramp Queuing Summary for EAP (2022) Conditions

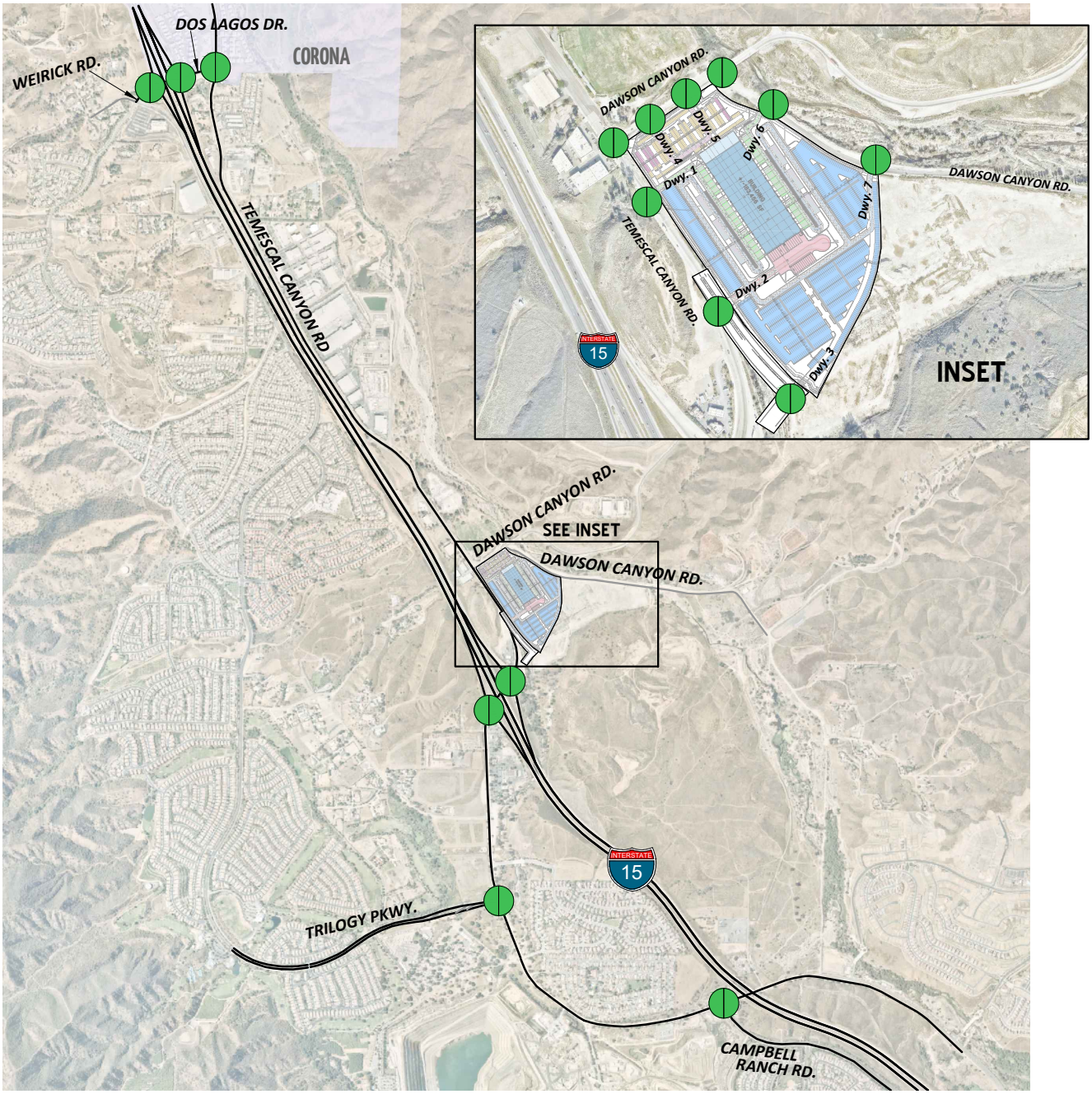
Intersection	Movement	Available Stacking Distance (Feet)	Existing (2020)				EAP (2022) Without Temescal Canyon Road Extension				EAP (2022) With Temescal Canyon Road Extension			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Weirick Rd.	SBL/T	360	316	141	Yes	Yes	346	184	Yes	Yes	346	184	Yes	Yes
	SBR	1,260	40	46	Yes	Yes	42	46	Yes	Yes	42	46	Yes	Yes
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T	1,330	145	75	Yes	Yes	162	114	Yes	Yes	257	240	Yes	Yes
	SBR	530	85	83	Yes	Yes	86	159	Yes	Yes	67	60	Yes	Yes
I-15 NB Ramps & Weirick Rd.	NBL/T	390	13	43	Yes	Yes	13	45	Yes	Yes	13	45	Yes	Yes
	NBR	1,250	24	29	Yes	Yes	25	30	Yes	Yes	25	30	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T/R	1,340	769	115	Yes	Yes	890 [2]	156	Yes	Yes	871 [2]	138	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

EXHIBIT 5-5: EAP (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-D
- = LOS E
- = LOS F

N

EXISTING TEMESCAL CANYON ROAD ALIGNMENT

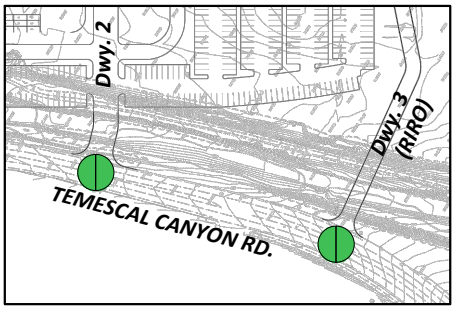
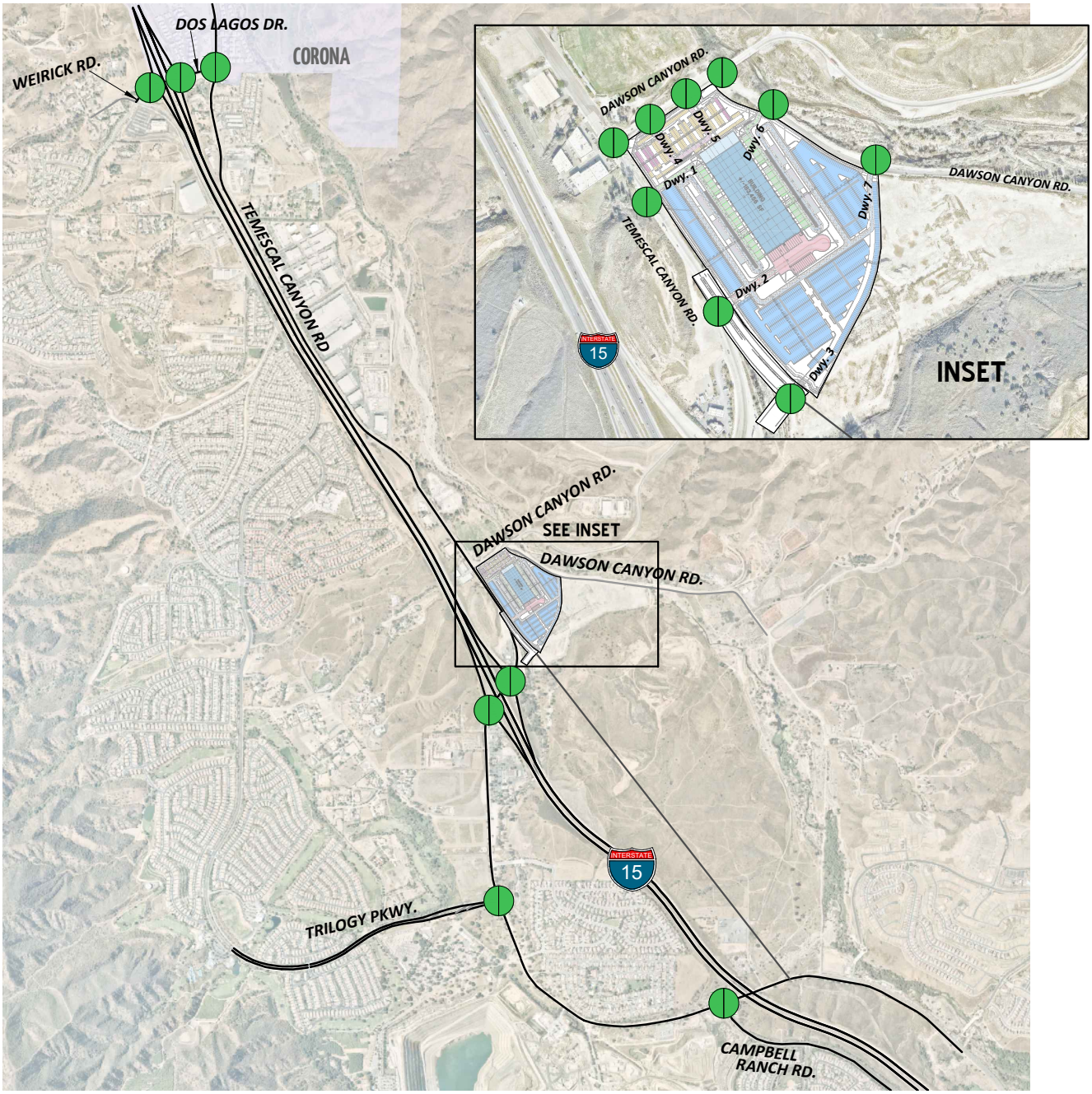


EXHIBIT 5-6: EAP (2022) WITH TEMESCAL CANYON ROAD EXTENSION SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-D
- = LOS E
- = LOS F

N

5.6 FREEWAY FACILITY ANALYSIS

EAP (2022) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 5-7. As shown in Table 5-3, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for EAP (2022) traffic conditions. EAP (2022) freeway facility analysis worksheets are provided in Appendix 5.7.

5.7 DEFICIENCIES AND IMPROVEMENTS

5.7.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

All study area intersections are anticipated to continue to operate at an acceptable LOS under EAP (2022) Without and With Temescal Canyon Road traffic conditions. As such, no improvements have been identified.

5.7.2 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 5-2, there are no anticipated peak hour queuing issues at the I-15 Freeway and Weirick Road and Temescal Canyon Road interchanges for EAP (2022) Without and With Temescal Canyon Road traffic conditions. As such, no improvements have been identified.

5.7.3 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

As shown previously in Table 5-3, there are no study area freeway mainline segments and ramp junctions that are anticipated to operate at an unacceptable LOS for EAP (2022) traffic conditions. As such, no improvements have been identified.

Table 5-3

Freeway Analysis for EAP (2022) Conditions

Freeway	Direction[1]	Mainline Segment	Lanes[2]	Existing (2020)				EAP (2022)			
				Density[3]		LOS[4]		Density[3]		LOS[4]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Weirick Rd.	3	20.6	30.9	C	D	21.6	33.7	C	D
		Off-Ramp at Weirick Rd.	3	25.7	32.4	C	D	26.7	33.7	C	D
		On-Ramp at Weirick Rd.	3	18.3	28.5	B	D	18.9	29.8	B	D
		Between Weirick Rd. and Temescal Canyon Rd.	3	17.5	29.0	B	D	18.3	31.1	C	D
		Off-Ramp at Temescal Canyon Rd.	3	20.1	29.0	C	D	20.7	30.2	C	D
		On-Ramp at Temescal Canyon Rd.	3	17.5	28.8	B	D	18.4	30.2	B	D
		South of Temescal Canyon Rd.	3	15.9	28.3	B	D	16.6	30.7	B	D
	NB	North of Weirick Rd.	3	24.5	22.0	C	C	26.1	23.3	D	C
		On-Ramp at Weirick Rd.	3	26.7	23.8	C	C	28.1	25.0	D	C
		Off-Ramp at Weirick Rd.	3	22.9	22.6	C	C	23.7	23.5	C	C
		Between Weirick Rd. and Temescal Canyon Rd.	3	19.1	18.7	C	C	20.0	19.6	C	C
		On-Ramp at Temescal Canyon Rd.	3	20.3	19.7	C	B	21.3	20.8	C	C
		Off-Ramp at Temescal Canyon Rd.	3	24.0	19.8	C	B	25.0	21.1	C	C
		South of Temescal Canyon Rd.	3	20.2	17.1	C	B	21.2	18.2	C	C

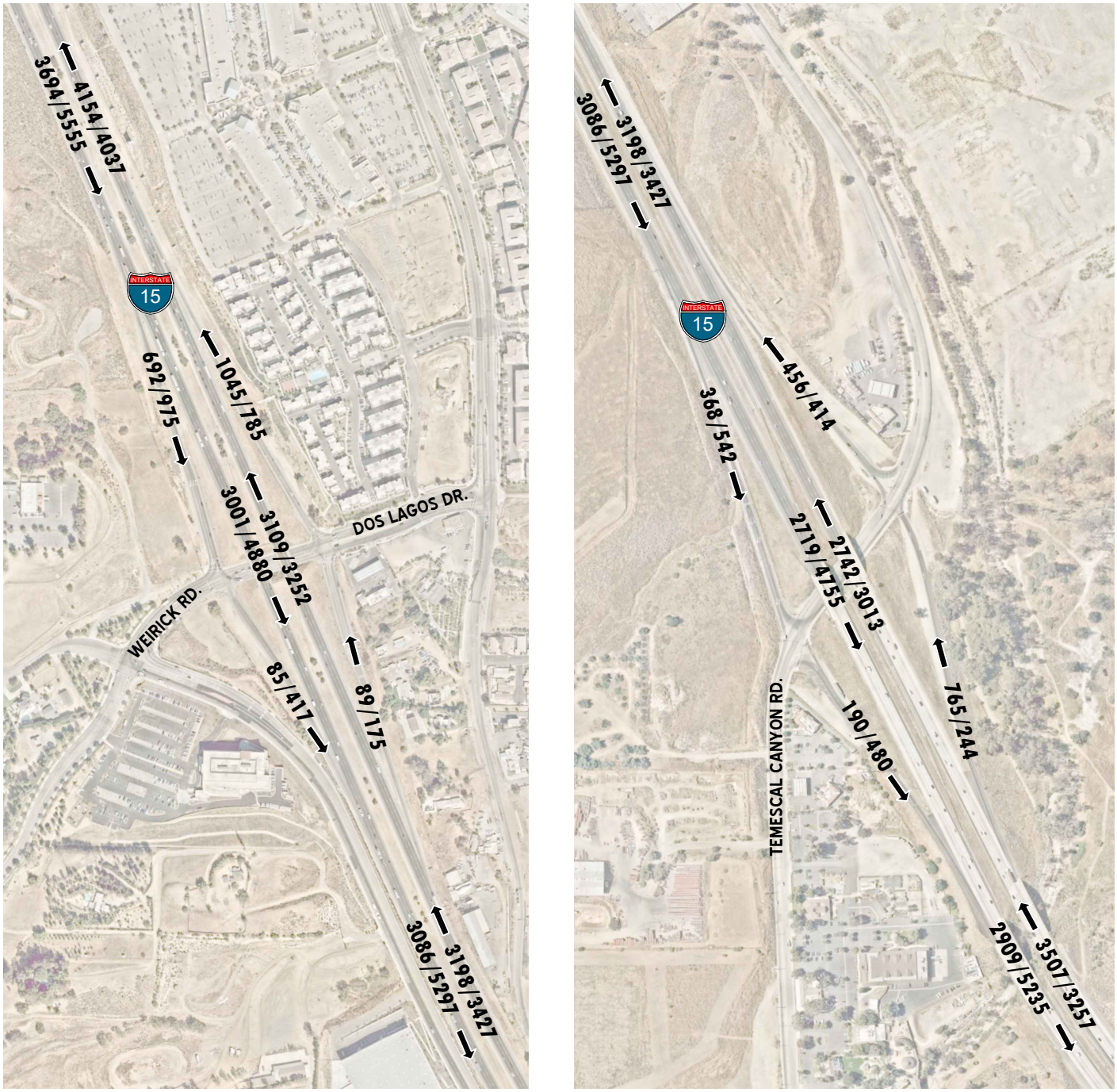
[1] NB = Northbound; SB = Southbound

[2] Number of lanes are in the specified direction and is based on existing conditions

[3] Density is measured by passenger cars per mile per lane (pc/mi/ln)

[4] LOS = Level of Service

EXHIBIT 5-7: EAP (2022) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

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6 EAPC (2022) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAPC (2022) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway facility operations analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC (2022) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

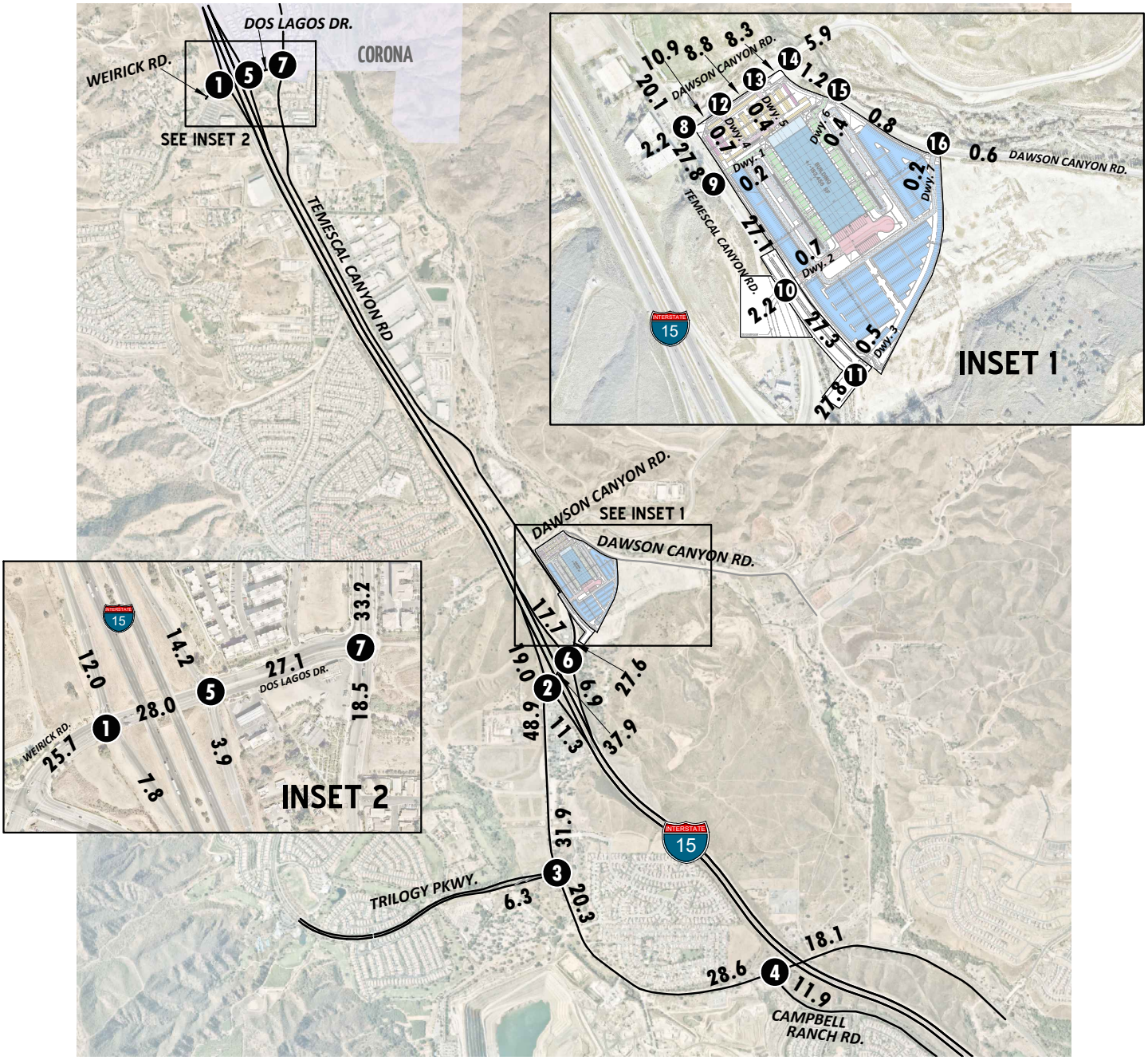
- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways). This includes the realignment of Temescal Canyon Road along the Project's frontage.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC (2022) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages).
- The Temescal Canyon Road widening improvements (from Dos Lagos to I-15 interchange) are assumed to be completed.
- The Temescal Canyon Road extension is assumed to be in place for "With Temescal Canyon Road Extension" conditions only.

6.2 EAPC (2022) TRAFFIC VOLUME FORECASTS

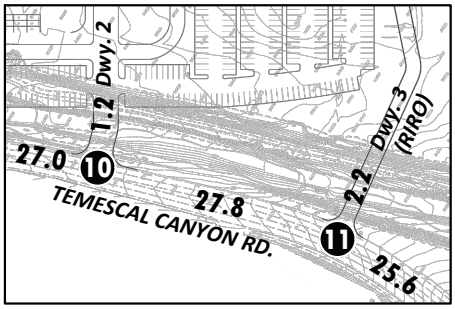
To account for background traffic, other known cumulative development projects in the study area were included in addition to 4.04% of ambient growth for EAPC (2022) traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and peak hour volumes (in PCE) for EAPC (2022) Without Temescal Canyon Road Extension are shown on Exhibits 6-1 and 6-2, respectively. For Without Temescal Canyon Road Extension conditions, an alternative has been evaluated for Driveways 2 and 3 at Temescal Canyon Road that evaluates the existing alignment of Temescal Canyon Road. The weekday ADT and peak hour volumes (in PCE) for the existing alignment alternative are also shown on Exhibits 6-1 and 6-2, respectively.

As previously discussed in Section 4.2 *Project Trip Distribution*, it is assumed that the Serrano Specific Plan will be constructing the future Temescal Canyon Road extension. However, the Project may be built and operational before the Serrano Specific Plan submits an implementing project. For the purposes of this TA, EAPC (2022) traffic conditions has been evaluated for both Without and With Temescal Canyon Road Extension, in the event the Serrano Specific Plan does or does not submit an implementing project before the Project is built and operational, therefore constructing the future extension of Temescal Canyon Road. The weekday ADT volumes and peak hour volumes (in PCE) which can be expected for EAPC (2022) With Temescal Canyon Road Extension traffic conditions are shown on Exhibits 6-3 and 6-4, respectively.

EXHIBIT 6-1: EAPC (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



EXISTING TEMESCAL CANYON ROAD ALIGNMENT

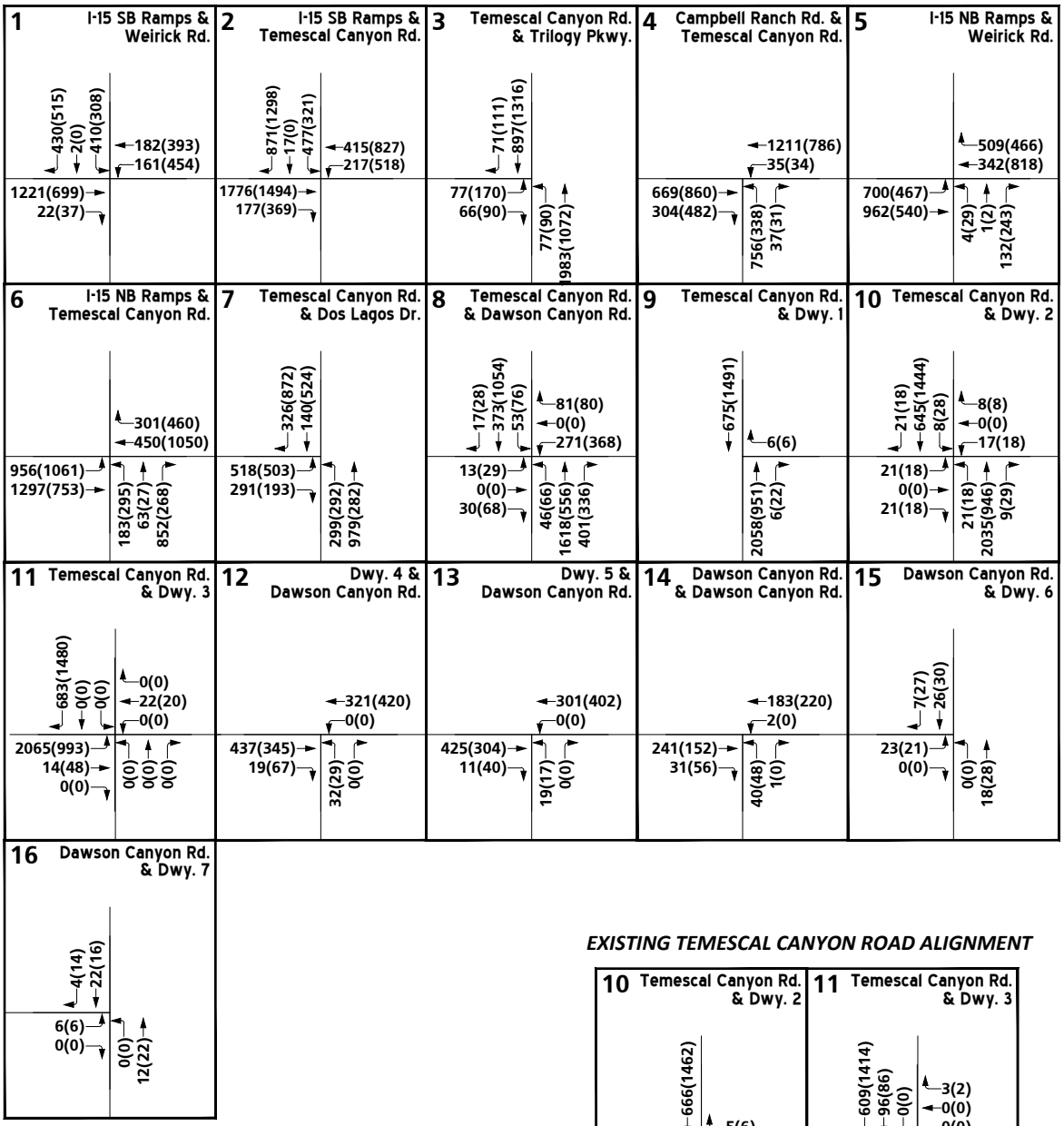


LEGEND:

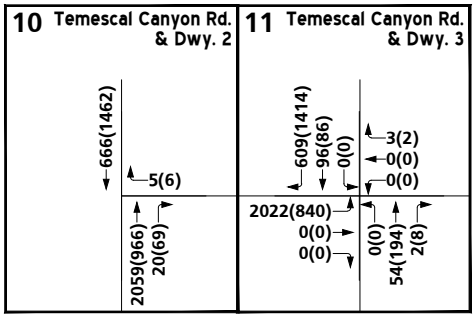
10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 6-2: EAPC (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



EXISTING TEMESCAL CANYON ROAD ALIGNMENT



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

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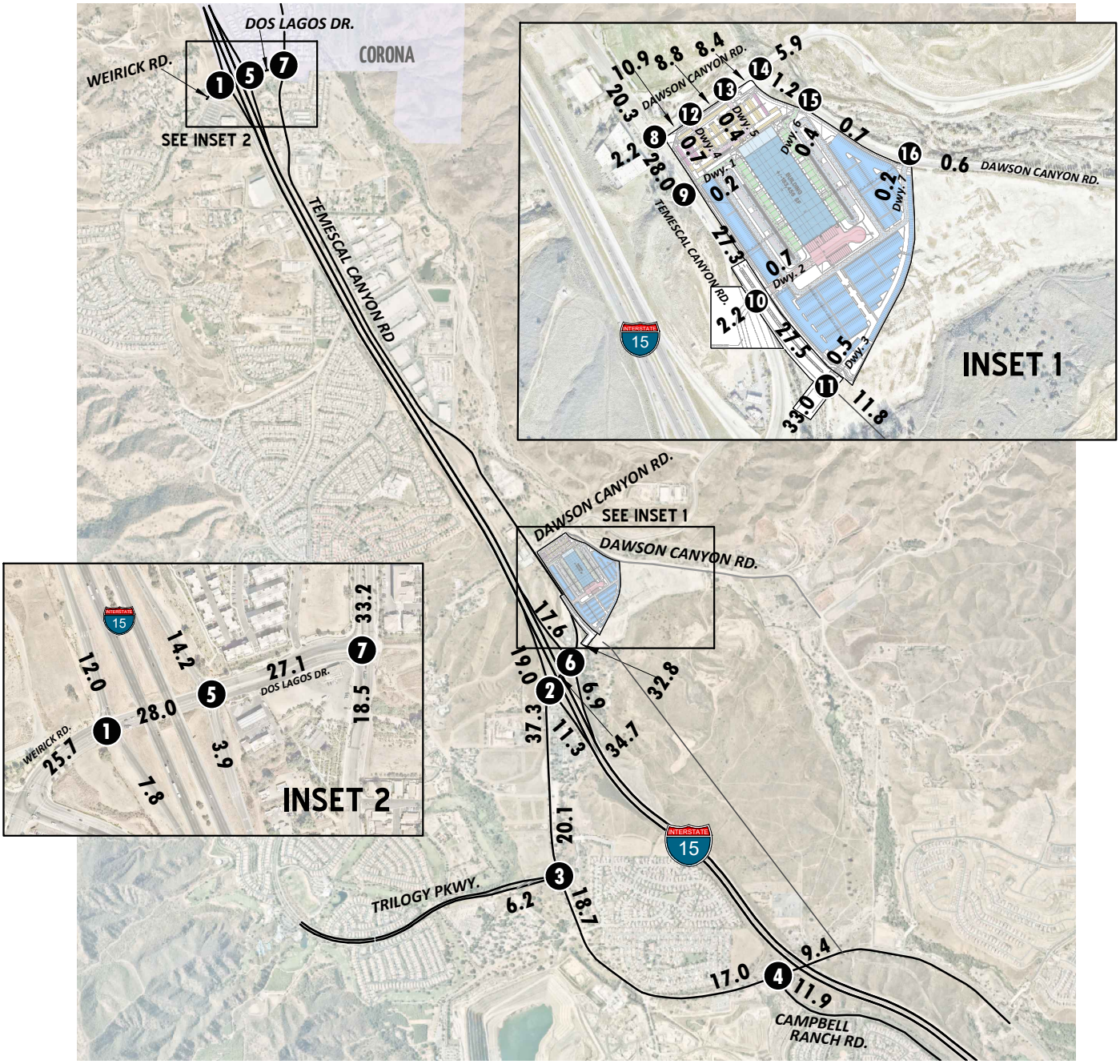
EXHIBIT 6-3: EAPC (2022) WITH TEMESCAL CANYON ROAD EXTENSION AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

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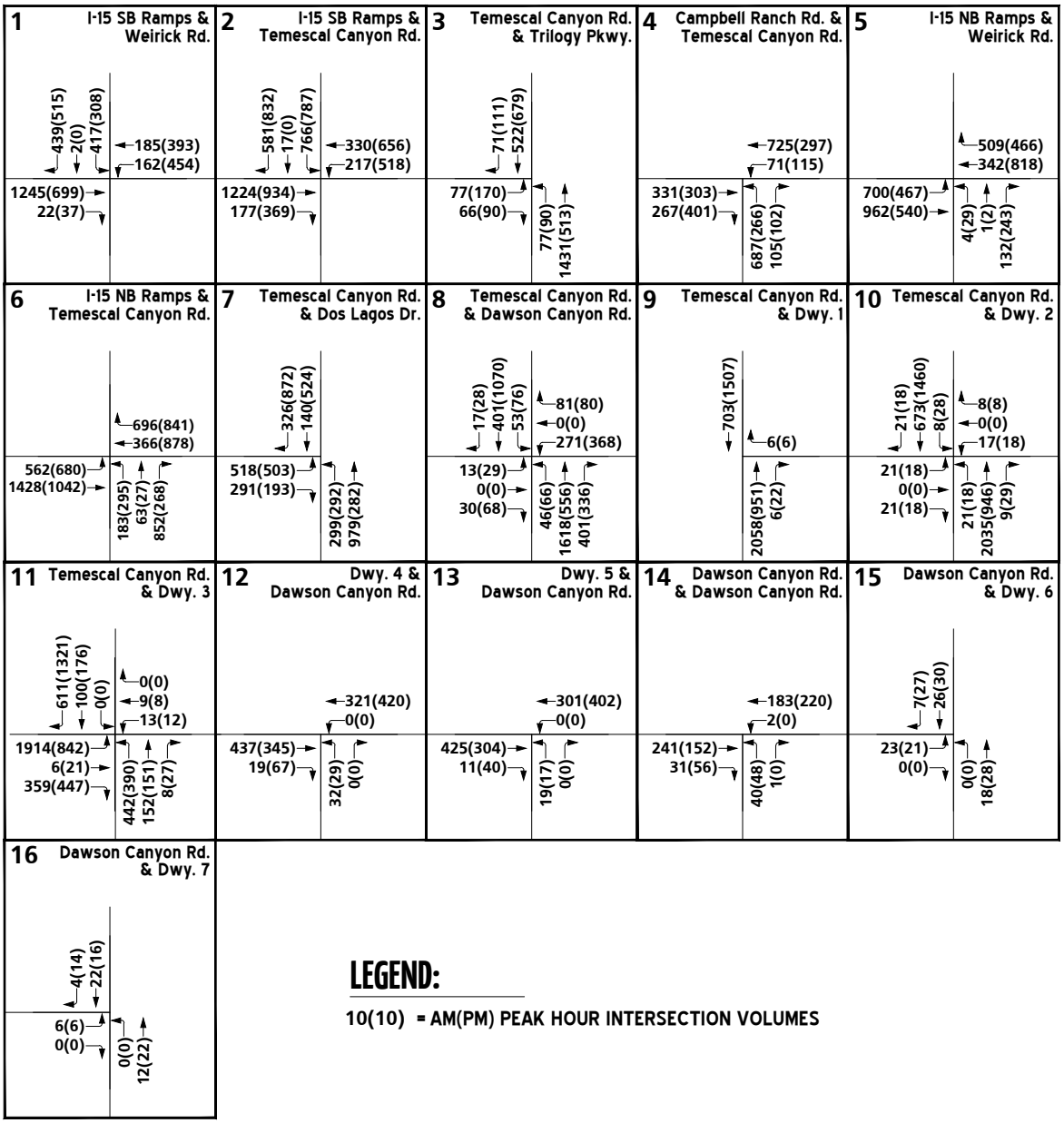
EXHIBIT 6-4: EAPC (2022) WITH TEMESCAL CANYON ROAD EXTENSION TRAFFIC VOLUMES (IN PCE)



6.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAPC (2022) conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the following study area intersections are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours under EAPC (2022) Without Temescal Canyon Road Extension traffic conditions:

- I-15 Southbound Ramps & Temescal Canyon Road (#2) – LOS F AM and PM peak hours
- Temescal Canyon Road & Trilogy Parkway (#3) – LOS F AM peak hour only
- Campbell Ranch Road & Temescal Canyon Road (#4) – LOS F AM peak hour only
- I-15 Northbound Ramps & Temescal Canyon Road (#6) – LOS F AM and PM peak hours
- Temescal Canyon Road & Driveway 3 (#11) – LOS F AM and PM peak hours

Project Driveways 2 and 3 on Temescal Canyon Road are anticipated to operate at an acceptable LOS during the peak hours with both the existing alignment and realignment of Temescal Canyon Road and the applicable driveway access restrictions.

With the future extension of Temescal Canyon Road, there are no additional study area intersections anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours under EAPC (2022) With Temescal Canyon Road Extension. The intersections of Temescal Canyon Road at Trilogy Parkway (#3) and Campbell Ranch Road at Temescal Canyon Road (#4) are anticipated to operate at an acceptable LOS with the future extension of Temescal Canyon Road. This is due to the shift in travel patterns as the future extension of Temescal Canyon Road provides an alternative northbound and southbound route for local traffic.

A summary of the peak hour intersection LOS for EAPC (2022) Without Temescal Canyon Road Extension and With Temescal Canyon Road Extension traffic conditions is shown on Exhibits 6-5 and 6-6, respectively. The intersection operations analysis worksheets for EAPC (2022) Without Temescal Canyon Road Extension and With Temescal Canyon Road Extension traffic conditions are included in Appendices 6.1 and 6.2, respectively.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants have been performed (based on CA MUTCD) for EAPC (2022) Without and With Temescal Canyon Road Extension traffic conditions based on daily volumes. For EAPC (2022) Without and With Temescal Canyon Road Extension traffic conditions, no additional study area intersections are anticipated to meet planning-level ADT traffic signal warrants in addition to the intersections previously warranted under EAP (2022) traffic conditions (see Appendices 6.3 and 6.4).

Table 6-1

Intersection Analysis for EAPC (2022) Conditions

#	Intersection	Traffic Control[2]	EAPC (2022) Without Temescal Canyon Road Extension				EAPC (2022) With Temescal Canyon Road Extension			
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	I-15 SB Ramps & Weirick Rd.	TS	29.4	31.7	C	C	29.8	31.7	C	C
2	I-15 SB Ramps & Temescal Canyon Rd.	TS	**116.9**	**>200.0**	**F**	**F**	**101.0**	**168.5**	**F**	**F**
3	Temescal Canyon Rd. & Trilogy Pkwy.	TS	**115.7**	43.2	**F**	D	23.4	14.5	C	B
4	Campbell Ranch Rd. & Temescal Canyon Rd.	TS	**160.4**	35.9	**F**	D	41.3	21.8	D	C
5	I-15 NB Ramps & Weirick Rd.	TS	19.6	17.6	B	B	19.6	17.6	B	B
6	I-15 NB Ramps & Temescal Canyon Rd.	TS	**197.0**	**>200.0**	**F**	**F**	**90.5**	**187.6**	**F**	**F**
7	Temescal Canyon Rd. & Dos Lagos Dr.	TS	24.2	28.1	C	C	24.2	28.1	C	C
8	Temescal Canyon Rd. & Dawson Canyon Rd.	TS	18.0	20.1	B	C	18.0	20.5	B	C
9	Temescal Canyon Rd. & Driveway 1	**CSS**	23.3	12.3	C	B	23.3	12.3	C	B
10	Temescal Canyon Rd. & Driveway 2	**TS**	10.8	8.9	B	A	10.8	8.9	B	A
	-With Existing Alignment	**TS**	9.2	6.2	A	A	Not Evaluated[3]			
11	Temescal Canyon Rd. & Driveway 3	**TS**	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**
	-With Existing Alignment	**CSS**	8.5	8.9	A	A	Not Evaluated[3]			
12	Driveway 4 & Dawson Canyon Rd.	**CSS**	16.8	17.3	C	C	16.8	17.3	C	C
13	Driveway 5 & Dawson Canyon Rd.	**CSS**	15.6	15.5	C	C	15.6	15.5	C	C
14	Dawson Canyon Rd. & Dawson Canyon Rd.	CSS	11.8	11.4	C	B	11.8	11.4	B	B
15	Dawson Canyon Rd. & Driveway 6	**CSS**	8.8	9.0	A	A	8.8	9.0	A	A
16	Dawson Canyon Rd. & Driveway 7	**CSS**	8.7	8.8	A	A	8.7	8.8	A	A

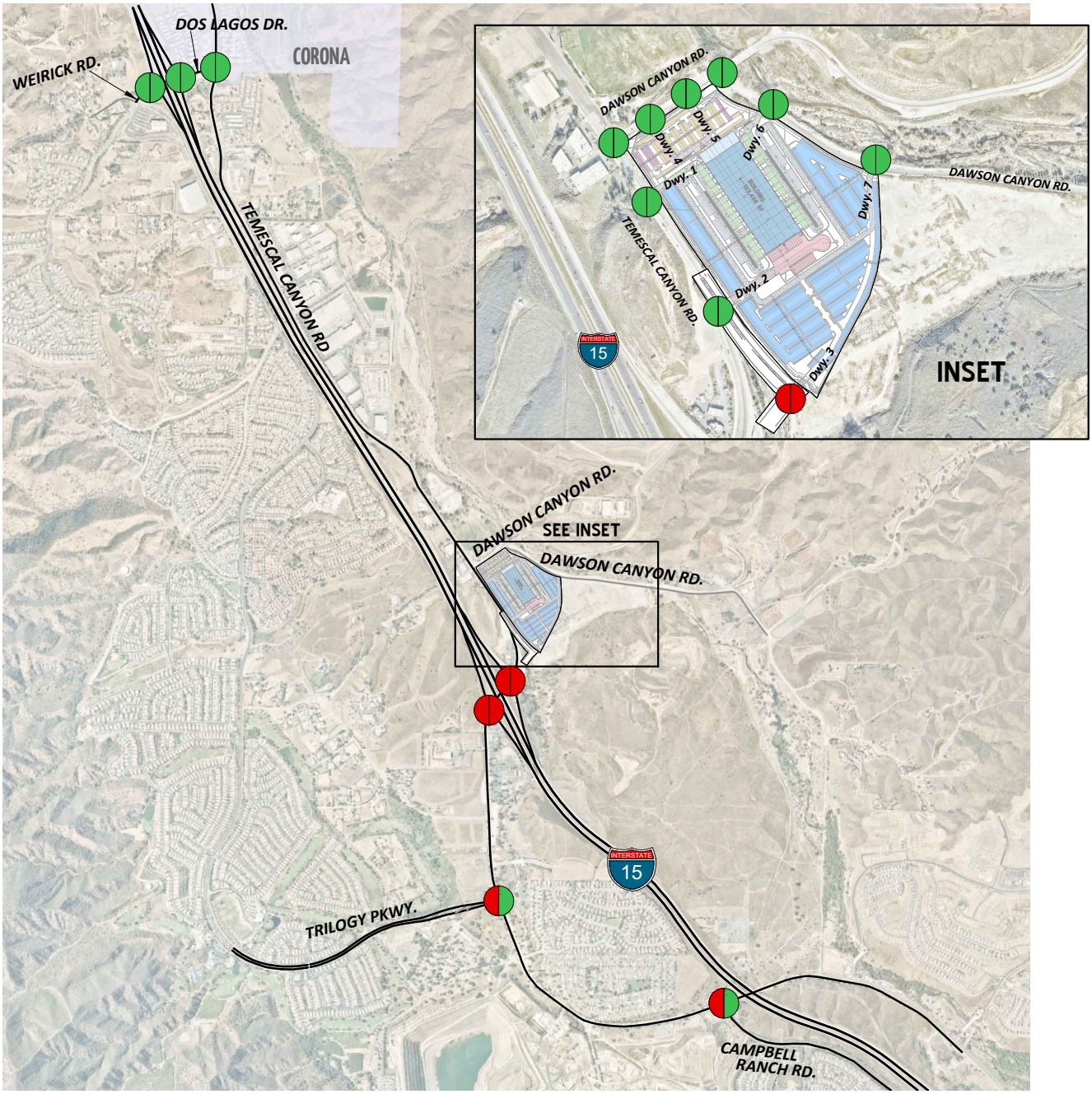
* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

2 CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

3 The existing alignment of Temescal Canyon Road has been evaluated for Without Temescal Canyon Road Extension conditions only since the future Temescal Canyon Road extension will realign the roadway along the Project's frontage.

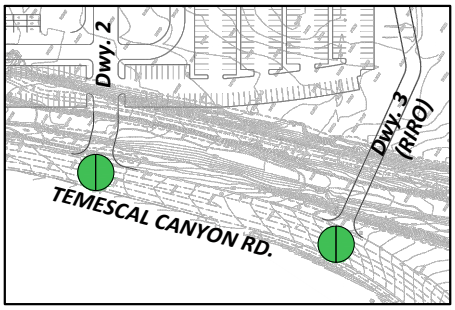
EXHIBIT 6-5: EAPC (2022) WITHOUT TEMESCAL CANYON ROAD EXTENSION SUMMARY OF LOS



LEGEND:

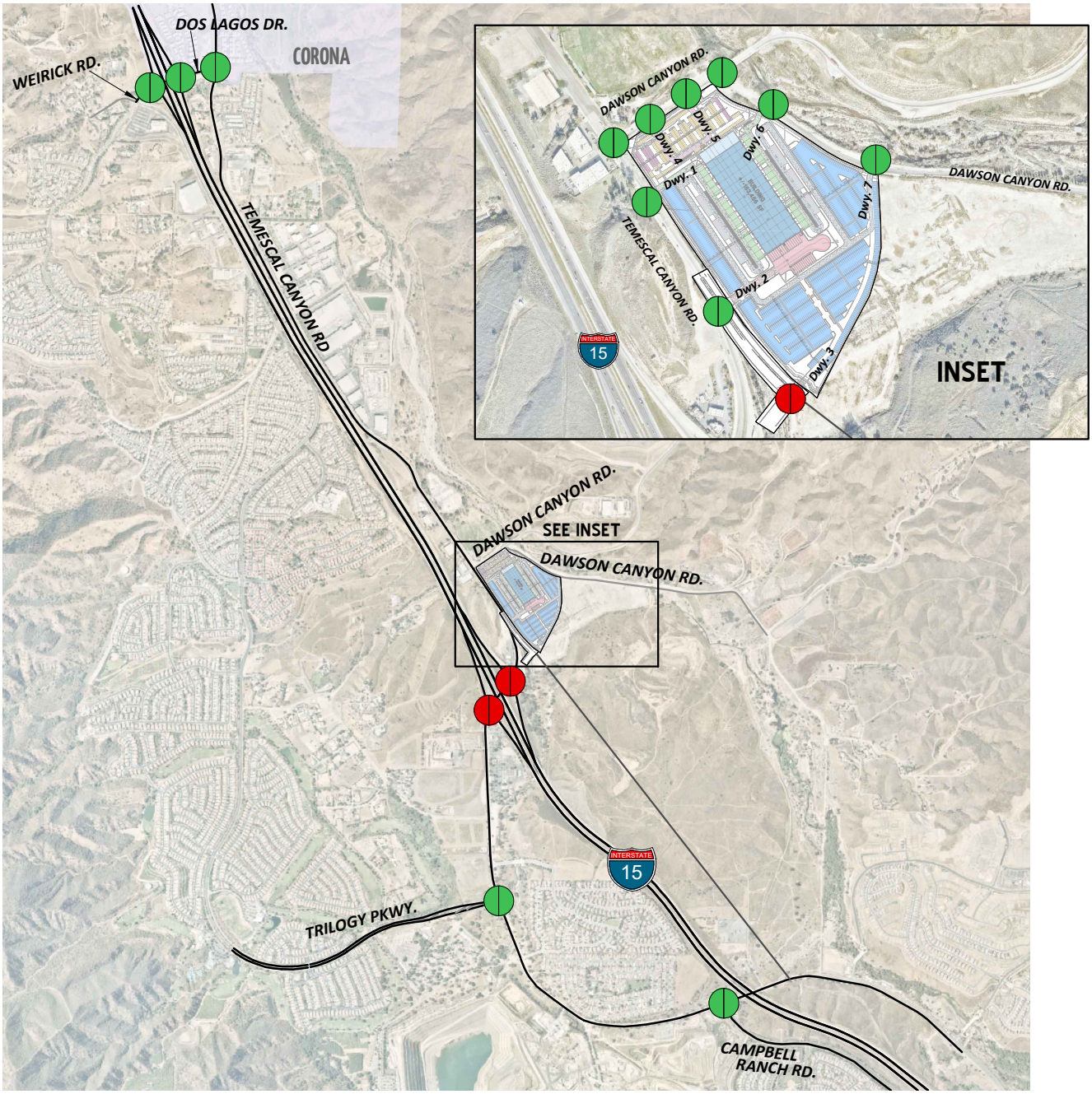
- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-D
- = LOS E
- = LOS F

EXISTING TEMESCAL CANYON ROAD ALIGNMENT



N

EXHIBIT 6-6: EAPC (2022) WITH TEMESCAL CANYON ROAD EXTENSION SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-D
- = LOS E
- = LOS F

N

6.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway at Weirick Road and Temescal Canyon Road interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 6-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 6-2, the following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2022) Without Temescal Canyon Road Extension traffic conditions:

- I-15 Southbound Ramps & Temescal Canyon Road (#2) SBR – PM peak hour only
- I-15 Northbound Ramps & Temescal Canyon Road (#6) NBL/T/R – AM peak hour only

With the future extension of Temescal Canyon Road, there are no additional movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2022) With Temescal Canyon Road Extension traffic conditions. Worksheets for EAPC (2022) Without and With Temescal Canyon Road Extension traffic conditions off-ramp queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

6.6 FREEWAY FACILITY ANALYSIS

Since the future Temescal Canyon Road Extension results in a shift to local traffic patterns only, freeway facility analysis has not been evaluated separately under Without or With Temescal Canyon Road Extension. In other words, regardless if the future Temescal Canyon Road Extension is in place or not, the amount of traffic accessing the freeway would be the same; the shift in travel patterns is only seen in how traffic will access the on-ramps or off-ramps from the local roads but not the total ramp volume. EAPC (2022) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 6-7.

As shown in Table 6-3, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for EAPC (2022) traffic conditions, with the exception of the following freeway segment:

- I-15 Freeway Southbound, North of Weirick Road (#1) – LOS E PM peak hour only

EAPC (2022) freeway facility analysis worksheets are provided in Appendix 6.7.

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for EAPC (2022) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EAPC (2022) Without Temescal Canyon Road Extension				EAPC (2022) With Temescal Canyon Road Extension			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Weirick Rd.	SBL/T	360	486 [2,3]	301	Yes	Yes	497 [2,3]	301	Yes	Yes
	SBR	1,260	41	43	Yes	Yes	42	43	Yes	Yes
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T	1,330	605 [2]	336	Yes	Yes	1,119 [2]	1,189 [2]	Yes	Yes
	SBR	530	805 [2,3]	**2,037** [2]	Yes	**No**	408 [2]	**1,086** [2]	Yes	**No**
I-15 NB Ramps & Weirick Rd.	NBL/T	390	13	45	Yes	Yes	13	45	Yes	Yes
	NBR	1,250	29	38	Yes	Yes	29	38	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T/R	1,340	**1,411** [2]	454	**No**	Yes	**1,414** [2]	467	**No**	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

Table 6-3

Freeway Analysis for EAPC (2022) Conditions

Freeway	Direction[1]	Mainline Segment	Lanes[2]	EAPC (2022)			
				Density[3]		LOS[4]	
				AM	PM	AM	PM
I-15	SB	North of Weirick Rd.	3	22.9	**35.8**	C	**E**
		Off-Ramp at Weirick Rd.	3	27.9	34.8	C	D
		On-Ramp at Weirick Rd.	3	20.3	30.7	C	D
		Between Weirick Rd. and Temescal Canyon Rd.	3	19.3	32.4	C	D
		Off-Ramp at Temescal Canyon Rd.	3	22.1	30.9	C	D
		On-Ramp at Temescal Canyon Rd.	3	19.4	31.0	B	D
		South of Temescal Canyon Rd.	3	17.6	31.9	C	D
	NB	North of Weirick Rd.	3	27.4	24.8	C	C
		On-Ramp at Weirick Rd.	3	29.3	26.4	D	C
		Off-Ramp at Weirick Rd.	3	24.4	24.7	C	C
		Between Weirick Rd. and Temescal Canyon Rd.	3	20.7	20.8	C	C
		On-Ramp at Temescal Canyon Rd.	3	22.1	22.1	C	C
		Off-Ramp at Temescal Canyon Rd.	3	25.7	22.2	C	C
		South of Temescal Canyon Rd.	3	21.9	19.0	C	C

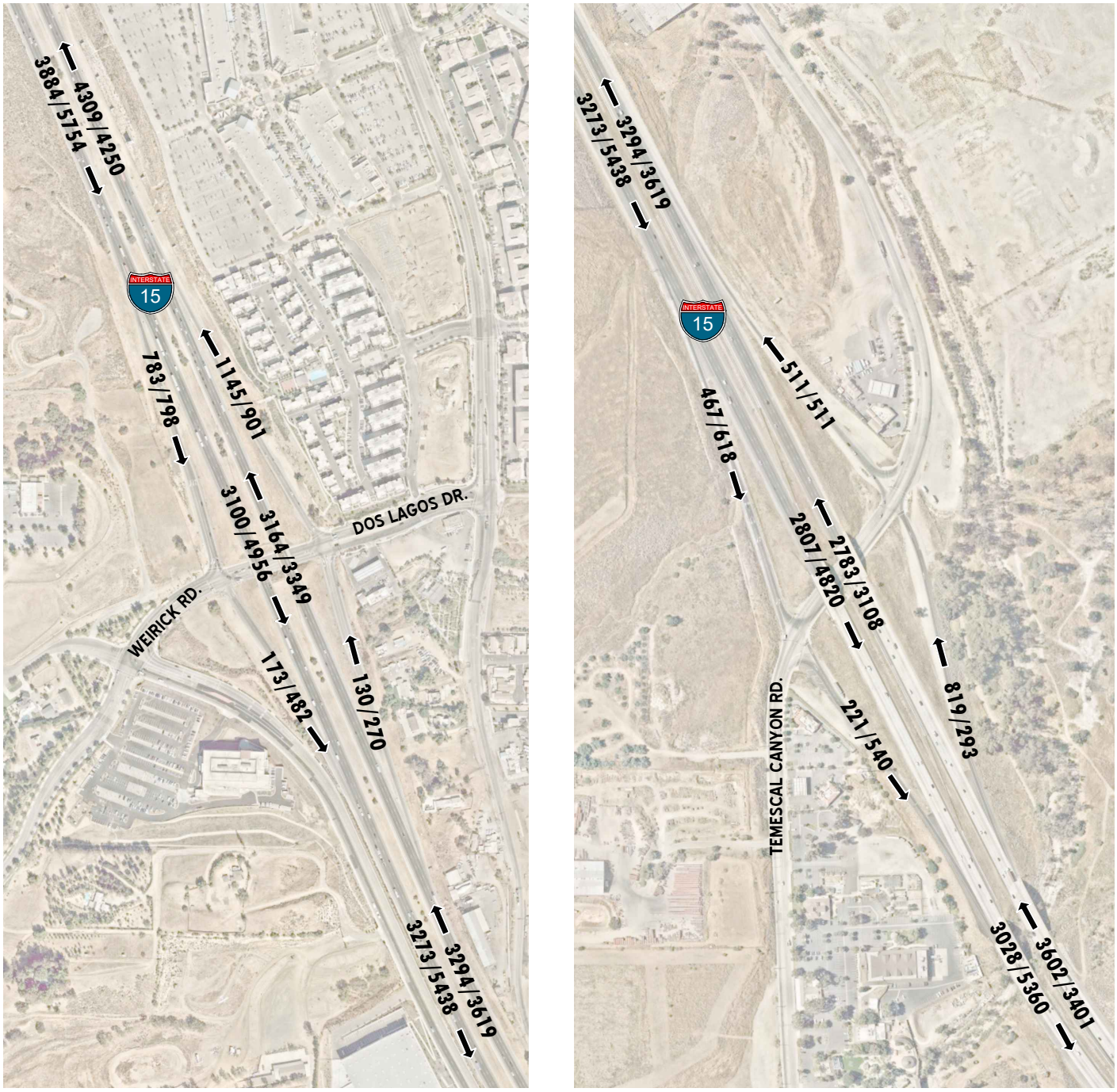
[1] NB = Northbound; SB = Southbound

[2] Number of lanes are in the specified direction and is based on existing conditions

[3] Density is measured by passenger cars per mile per lane (pc/mi/ln)

[4] LOS = Level of Service

EXHIBIT 6-7: EAPC (2022) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

6.7 DEFICIENCIES AND IMPROVEMENTS

This section provides a summary of deficiencies and recommended improvements for EAPC (2022) traffic conditions. Based on the deficiency criteria discussed in Section 2.8 *Deficiency Criteria*, the following intersections were found to be deficient. Improvements necessary to improve traffic deficiencies back to acceptable levels are also discussed below.

6.7.1 IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been identified at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to acceptable LOS. The effectiveness of the identified improvement strategies to address EAPC (2022) traffic deficiencies are presented in Table 6-4 and described below. The intersection operations analysis worksheets for EAPC (2022) Without Temescal Canyon Road Extension and With Temescal Canyon Road Extension traffic conditions, with improvements, are included in Appendices 6.8 and 6.9, respectively. The following improvements are necessary for EAPC (2022) Without Temescal Canyon Road Extension:

I-15 Southbound Ramps & Temescal Canyon Road (#2) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a southbound left turn lane.
- Add a 2nd southbound right turn lane.

Temescal Canyon Road & Trilogy Parkway (#3) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.

Campbell Ranch Road & Temescal Canyon Road (#4) – The following improvement is necessary to bring the LOS back to acceptable levels:

- Add a 2nd westbound through lane.

I-15 Northbound Ramps & Temescal Canyon Road (#6) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a northbound right turn lane.
- Add a 2nd northbound right turn lane.
- Restripe the eastbound approach to provide dual left turn lanes and one through lane.

Table 6-4

Intersection Analysis for EAPC (2022) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
2	I-15 SB Ramps & Temescal Canyon Rd.																	
	- Without Temescal Canyon Road Extension																	
	- Without Improvements	TS	0	0	0	0	1	1	0	2	1>>	1	1	0	**116.9**	**>200.0**	**F**	**F**
	- With Improvements	TS	0	0	0	**1**	1	**2**	0	2	1>>	1	1	0	44.3	46.4	D	D
	- With Temescal Canyon Road Extension																	
	- Without Improvements	TS	0	0	0	0	1	1	0	2	1>>	1	1	0	**101.0**	**168.5**	**F**	**F**
	- With Improvements	TS	0	0	0	**1**	1	**2**	0	2	1>>	1	1	0	48.8	53.8	D	D
3	Temescal Canyon Rd. & Trilogy Pkwy.																	
	- Without Temescal Canyon Road Extension																	
	- Without Improvements	TS	1	1	0	0	1	1	1	0	1	0	0	0	**115.7**	43.2	**F**	D
	- With Improvements	TS	1	**2**	0	0	**2**	**0**	1	0	1	0	0	0	8.6	12.9	A	B
	- With Temescal Canyon Road Extension																	
	- Without Improvements	TS	1	1	0	0	1	1	1	0	1	0	0	0	23.4	14.5	C	B
	- With Improvements		Not Applicable															
4	Campbell Ranch Rd. & Temescal Canyon Rd.																	
	- Without Temescal Canyon Road Extension																	
	- Without Improvements	TS	1	0	1	0	0	0	0	1	1	1	1	0	**160.4**	35.9	**F**	D
	- With Improvements	TS	1	0	1	0	0	0	0	1	1	1	**2**	0	43.4	22.1	D	C
	- With Temescal Canyon Road Extension																	
	- Without Improvements	TS	1	0	1	0	0	0	0	1	1	1	1	0	41.3	21.8	D	C
	- With Improvements		Not Applicable															
6	I-15 NB Ramps & Temescal Canyon Rd.																	
	- Without Temescal Canyon Road Extension																	
	- Without Improvements	TS	0	1	0	0	0	0	1	2	0	0	2	1	**197.0**	**>200.0**	**F**	**F**
	- With Improvements	TS	0	1	**2**	0	0	0	**2**	**1**	0	0	2	1	42.1	28.5	D	C
	- With Temescal Canyon Road Extension																	
	- Without Improvements	TS	0	1	0	0	0	0	1	2	0	0	2	1	**90.5**	**187.6**	**F**	**F**
	- With Improvements	TS	0	1	**2**	0	0	0	**2**	**1**	0	0	2	1	54.0	24.1	D	C
11	Temescal Canyon Rd. & Driveway 3																	
	- Without Temescal Canyon Road Extension																	
	- Without Improvements	**TS**	0	0	0	**1**	0	**1**	**2**	**1**	0	0	**1**	0	**>200.0**	**>200.0**	**F**	**F**
	- With Improvements	**TS**	0	0	0	**1**	0	**1>**	**2**	**1**	0	0	**1**	0	5.1	31.2	A	C
	- With Temescal Canyon Road Extension																	
	- Without Improvements	**TS**	**1**	**2**	0	**1**	**2**	**1**	**2**	**1**	**1**	0	**1**	0	**>200.0**	**>200.0**	**F**	**F**
	- With Improvements	**TS**	**2**	**2**	0	**1**	**2**	**1>**	**2**	**1**	**1>**	0	**1**	0	53.9	45.1	D	D

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; **TS** = Improvement

Temescal Canyon Road & Driveway 3 (#11) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Install a traffic signal (Project design feature).
- Add a southbound left turn lane (Project design feature).
- Add a southbound right turn lane (Project design feature).
- Add an eastbound left turn lane (Project design feature).
- Add a 2nd eastbound left turn lane (Project design feature).
- Add an eastbound through lane (Project design feature).
- Add a westbound shared left-through-right turn lane (Project design feature).
- Modify the traffic signal to implement overlap phasing for the southbound right turn lane.

With the future extension of Temescal Canyon Road, the following additional improvements are necessary for EAPC (2022) With Temescal Canyon Road Extension, in addition to the improvements identified for EAPC (2022) Without Temescal Canyon Road Extension.

Temescal Canyon Road & Driveway 3 (#11) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a northbound left turn lane.
- Add a 2nd northbound left turn lane.
- Add a northbound through lane.
- Add a 2nd northbound through lane.
- Add a southbound through lane (Project design feature).
- Add a 2nd southbound through lane (Project design feature).
- Add an eastbound right turn lane (Project design feature).
- Modify the traffic signal to implement overlap phasing for the eastbound right turn lane.

The intersections of Temescal Canyon Road at Trilogy Parkway (#3) and Campbell Ranch Road at Temescal Canyon Road (#4) are anticipated to operate at an acceptable LOS during the peak hours under EAPC (2022) With Temescal Canyon Road Extension. As such, the intersection improvements are not necessary for With Temescal Canyon Road Extension conditions.

6.7.2 IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously in Table 6-2, there are two movements anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under EAPC (2022) Without Temescal Canyon Road and With Temescal Canyon Road traffic conditions. Table 6-5 shows the effectiveness of the improvement strategies at the intersections that experience off-ramp queuing issues during EAPC (2022) Without Temescal Canyon Road and With Temescal Canyon Road traffic conditions. With the proposed intersection improvements at the study area freeway ramp-to-arterial intersection (see Table 6-4), the analysis indicates that there are no queuing issues anticipated that may potentially "spill back" onto the I-15 Freeway mainline during the peak hours for both EAPC (2022) Without Temescal Canyon Road and With Temescal Canyon Road traffic conditions (see Table 6-5). Off-ramp queuing analysis worksheets with improvements for EAPC (2022) Without Temescal Canyon Road and With Temescal Canyon Road traffic conditions are provided in Appendices 6.10 and 6.11, respectively.

6.7.3 IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

As shown previously in Table 6-3, there is one study area freeway mainline segment that is anticipated to operate at an unacceptable LOS for EAPC (2022) traffic conditions. At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the County of Riverside (or other neighboring jurisdictions) on the SHS roadway segments. As such, no improvements have been recommended to address the EAPC (2022) deficiency on the SHS.

Table 6-5

Peak Hour Freeway Off-Ramp Queuing Summary for EAPC (2022) Conditions With Improvements

Intersection	Movement[5]	Available Stacking Distance (Feet)[6]	EAPC (2022) Without Temescal Canyon Extension				EAPC (2022) With Temescal Canyon Extension			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T[4]	**1,650**	994 [2]	1,114 [2]	Yes	Yes	684 [2]	491 [2]	Yes	Yes
	SBR	530	207	1,066 [2,3]	Yes	Yes	95	787 [2,3]	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T	1,340	274	396 [2]	Yes	Yes	264	396 [2]	Yes	Yes
	NBR	**600**	586 [2]	47	Yes	Yes	539 [2]	38	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

[4] Consistent with the intersection improvements on Table 7-4, a southbound left turn lane is recommended at this intersection. However, the outputs of the synchro queuing reports are limited to report the queue per movement. As such, the available stacking distance reflected is the total stacking distance of the southbound left and shared left-through lane.

[5] **NBR** = Improvement

[6] **100** = Improvement

7 HORIZON YEAR (2040) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2040) Without and With Project traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway facility operations analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2040) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year (2040) conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways). This includes the realignment of Temescal Canyon Road along the Project's frontage.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year (2040) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages).
- The Temescal Canyon Road widening improvements (from Dos Lagos to I-15 interchange) are assumed to be completed.
- The Temescal Canyon Road Extension is assumed to be in place. As such, Without Temescal Canyon Road Extension has not been evaluated for Horizon Year (2040) traffic conditions.

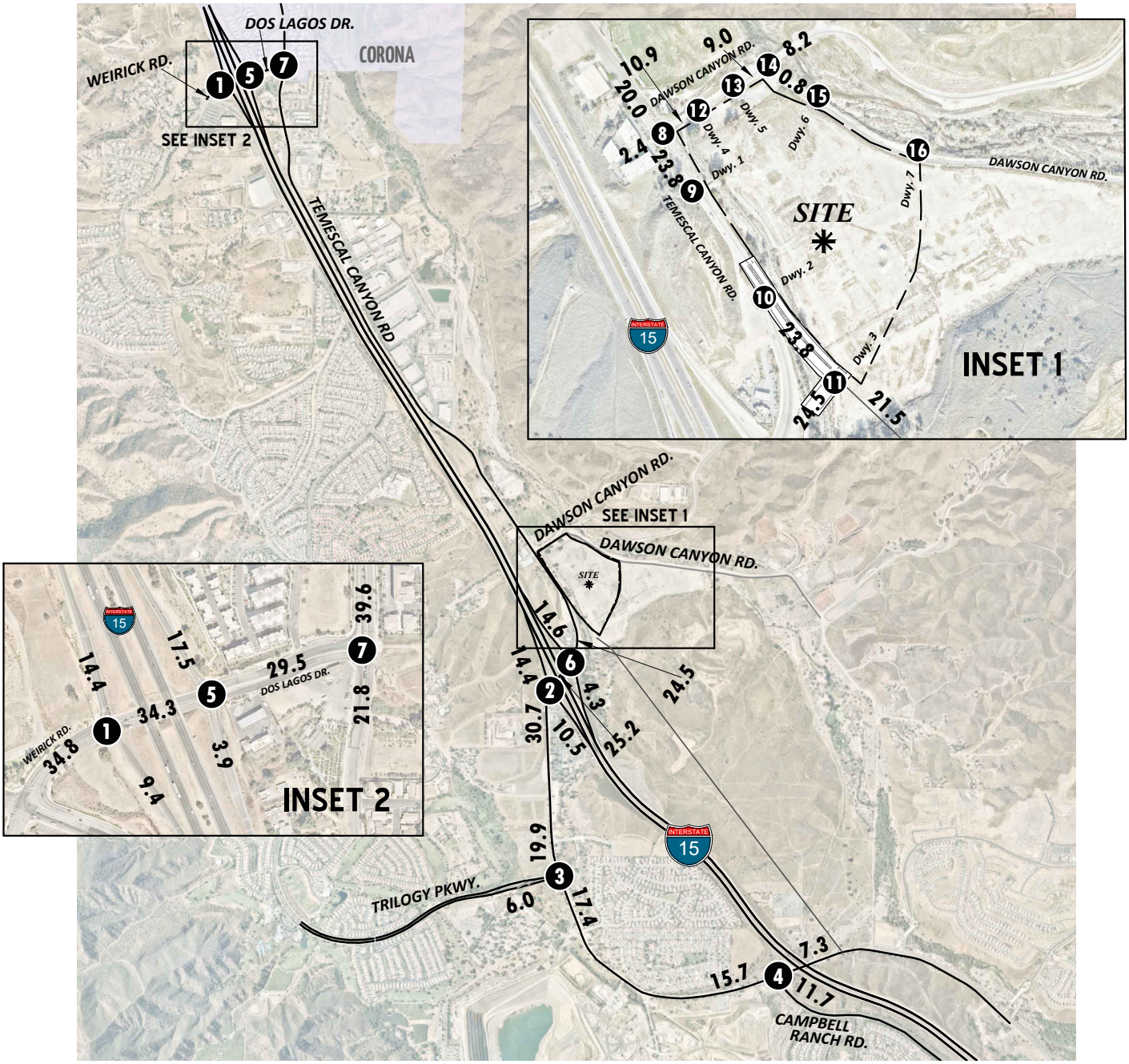
7.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM consistent with the currently adopted General Plan Circulation Element (see Section 4.8 *Horizon Year Volume Development* of this TA for a detailed discussion on the post-processing methodology). The Horizon Year (2040) Without Project traffic forecasts reflect the future roadway network contemplated by the County's General Plan, which includes the future Temescal Canyon Road extension. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project traffic conditions are shown on Exhibits 7-1 and 7-2, respectively.

7.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM consistent with the currently adopted General Plan Circulation Element, plus proposed Project volumes. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project traffic conditions are shown on Exhibits 7-3 and 7-4, respectively.

EXHIBIT 7-1: HORIZON YEAR (2040) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

EXHIBIT 7-2: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

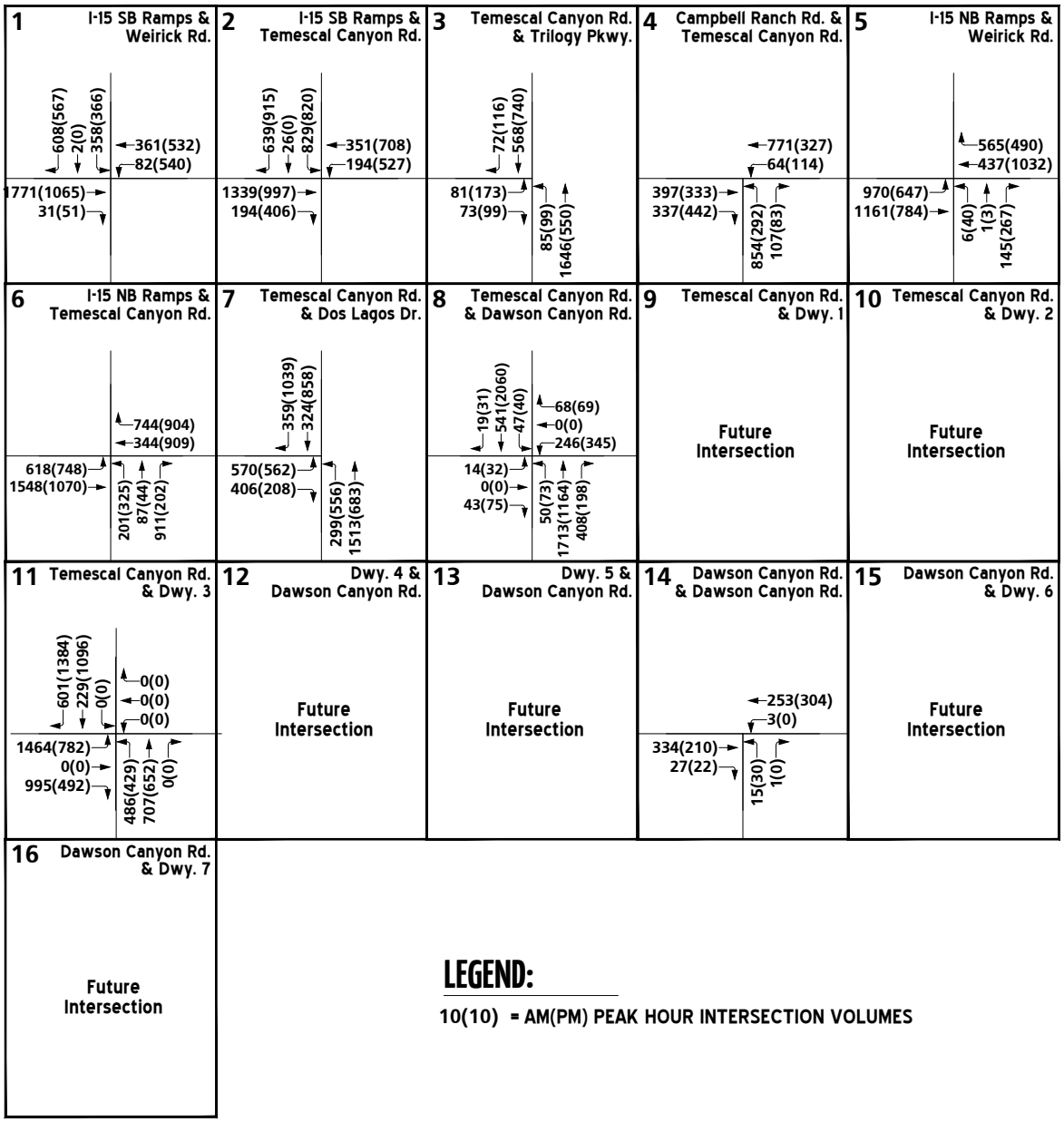
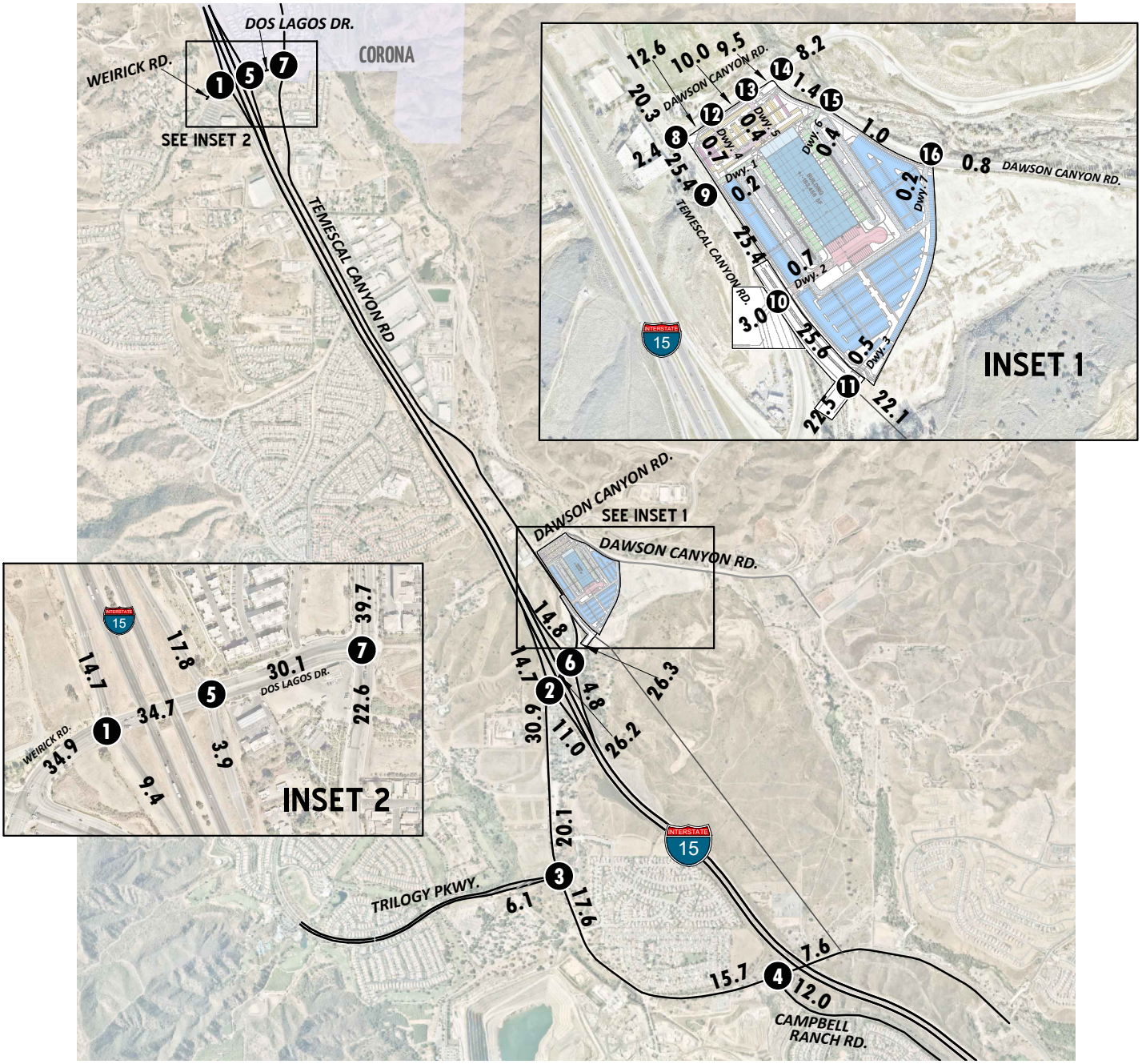


EXHIBIT 7-3: HORIZON YEAR (2040) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

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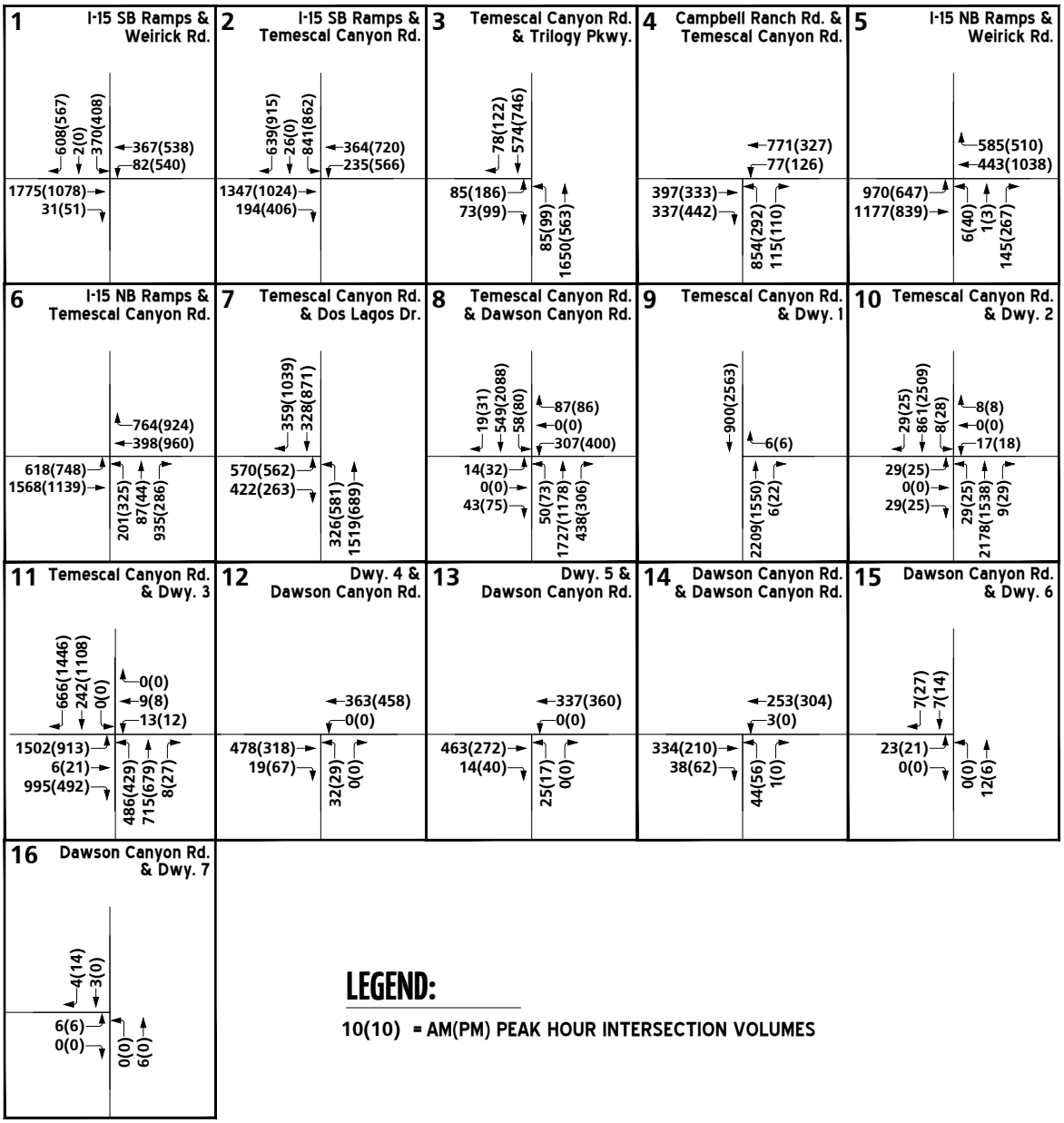
URBAN CROSSROADS

EXHIBIT 7-4: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

Level of service calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2040) Without Project traffic conditions with existing roadway and intersection geometrics consistent with those described under Section 7.1 *Roadway Improvements*. As shown in Table 7-1 and illustrated on Exhibit 7-5, the following study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project traffic conditions:

- I-15 Southbound Ramps & Temescal Canyon Road (#2) – LOS F AM and PM peak hours
- I-15 Northbound Ramps & Temescal Canyon Road (#6) – LOS F AM and PM peak hours
- Temescal Canyon Road & Driveway 3 (#11) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for Horizon Year (2040) Without Project traffic conditions are included in Appendix 7.1 of this report.

7.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown in Table 7-1 and illustrated on Exhibit 7-6, with the addition of Project traffic, there are no additional intersections anticipated to result in an unacceptable LOS, in addition to the intersections previously identified under Horizon Year (2040) Without Project traffic conditions. The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 7.2 of this report.

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

7.5.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

Traffic signal warrants have been performed (based on CA MUTCD) for Horizon Year (2040) With Project traffic conditions based on daily volumes. For Horizon Year (2040) Without and With Project traffic conditions, no additional study area intersections are anticipated to meet planning-level ADT traffic signal warrants in addition to the intersections previously warranted under EAP (2022) traffic conditions (see Appendices 7.3 and 7.4, respectively).

Table 7-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[3]	2040 Without Project				2040 With Project			
			Delay (secs.)[1]		LOS[2]		Delay (secs.)[1]		LOS[2]	
			AM	PM	AM	PM	AM	PM	AM	PM
1	I-15 SB Ramps & Weirick Rd.	TS	30.2	36.3	C	D	31.7	38.3	C	D
2	I-15 SB Ramps & Temescal Canyon Rd.	TS	**122.0**	**170.4**	**F**	**F**	**126.0**	**184.9**	**F**	**F**
3	Temescal Canyon Rd. & Trilogy Pkwy.	TS	45.4	15.2	D	B	46.0	15.6	D	B
4	Campbell Ranch Rd. & Temescal Canyon Rd.	TS	53.3	22.4	D	C	53.7	22.6	D	C
5	I-15 NB Ramps & Weirick Rd.	TS	29.6	20.2	C	C	30.2	20.1	C	C
6	I-15 NB Ramps & Temescal Canyon Rd.	TS	**118.1**	**195.8**	**F**	**F**	**133.3**	**>200.0**	**F**	**F**
7	Temescal Canyon Rd. & Dos Lagos Dr.	TS	25.8	28.2	C	C	30.9	29.9	C	C
8	Temescal Canyon Rd. & Dawson Canyon Rd.	TS	18.9	47.5	B	D	27.4	49.7	C	D
9	Temescal Canyon Rd. & Driveway 1	**CSS**	Future Intersection				25.9	17.0	D	C
10	Temescal Canyon Rd. & Driveway 2	**TS**	Future Intersection				13.1	26.9	B	C
11	Temescal Canyon Rd. & Driveway 3	**TS**	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**
12	Driveway 4 & Dawson Canyon Rd.	**CSS**	Future Intersection				18.5	17.5	C	C
13	Driveway 5 & Dawson Canyon Rd.	**CSS**	Future Intersection				17.2	14.3	C	B
14	Dawson Canyon Rd. & Dawson Canyon Rd.	CSS	15.7	12.7	C	B	13.9	13.1	B	B
15	Dawson Canyon Rd. & Driveway 6	**CSS**	Future Intersection				8.7	8.8	A	A
16	Dawson Canyon Rd. & Driveway 7	**CSS**	Future Intersection				8.6	8.6	A	A

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street-stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] LOS = Level of Service

[3] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

EXHIBIT 7-5: HORIZON YEAR (2040) WITHOUT PROJECT SUMMARY OF LOS

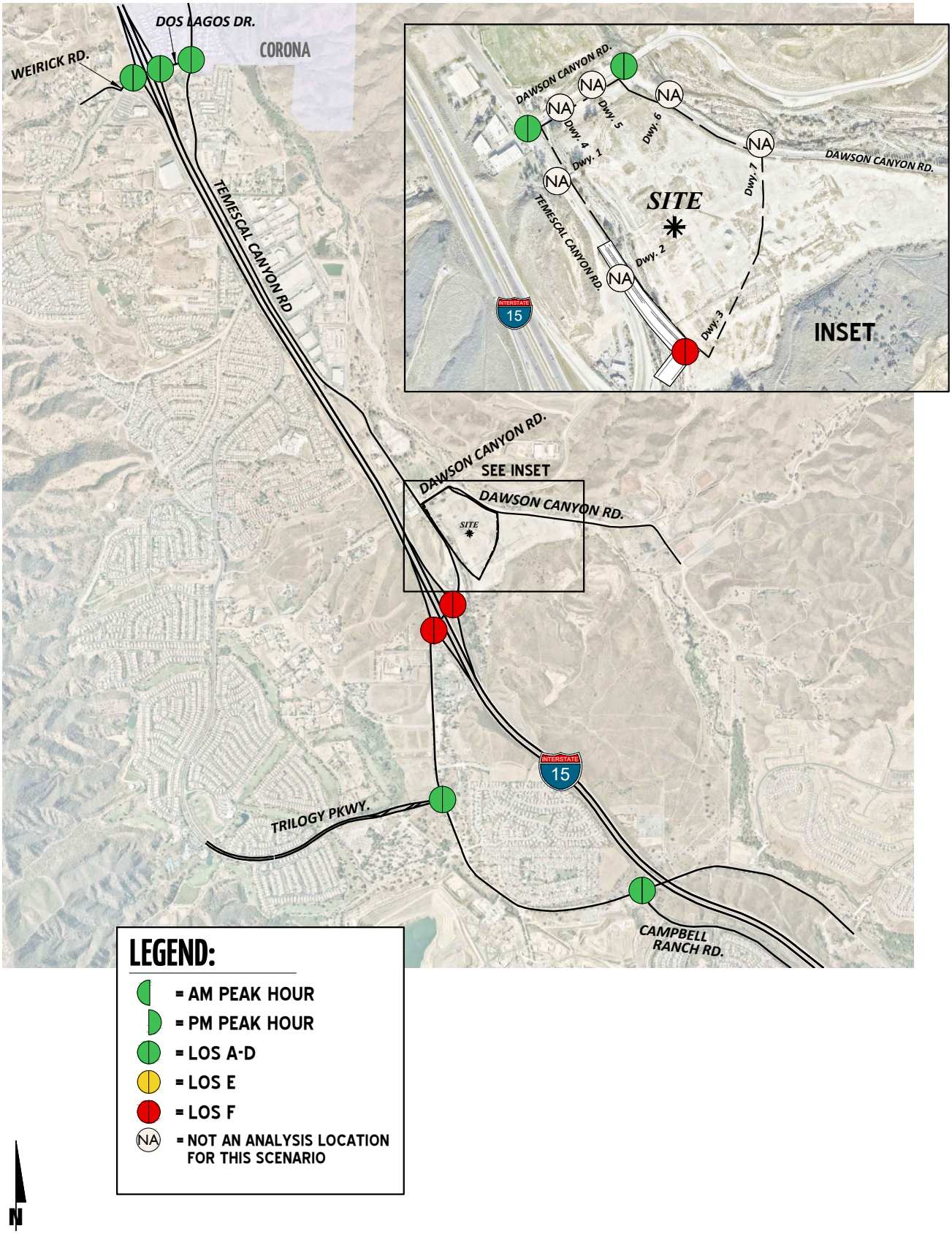


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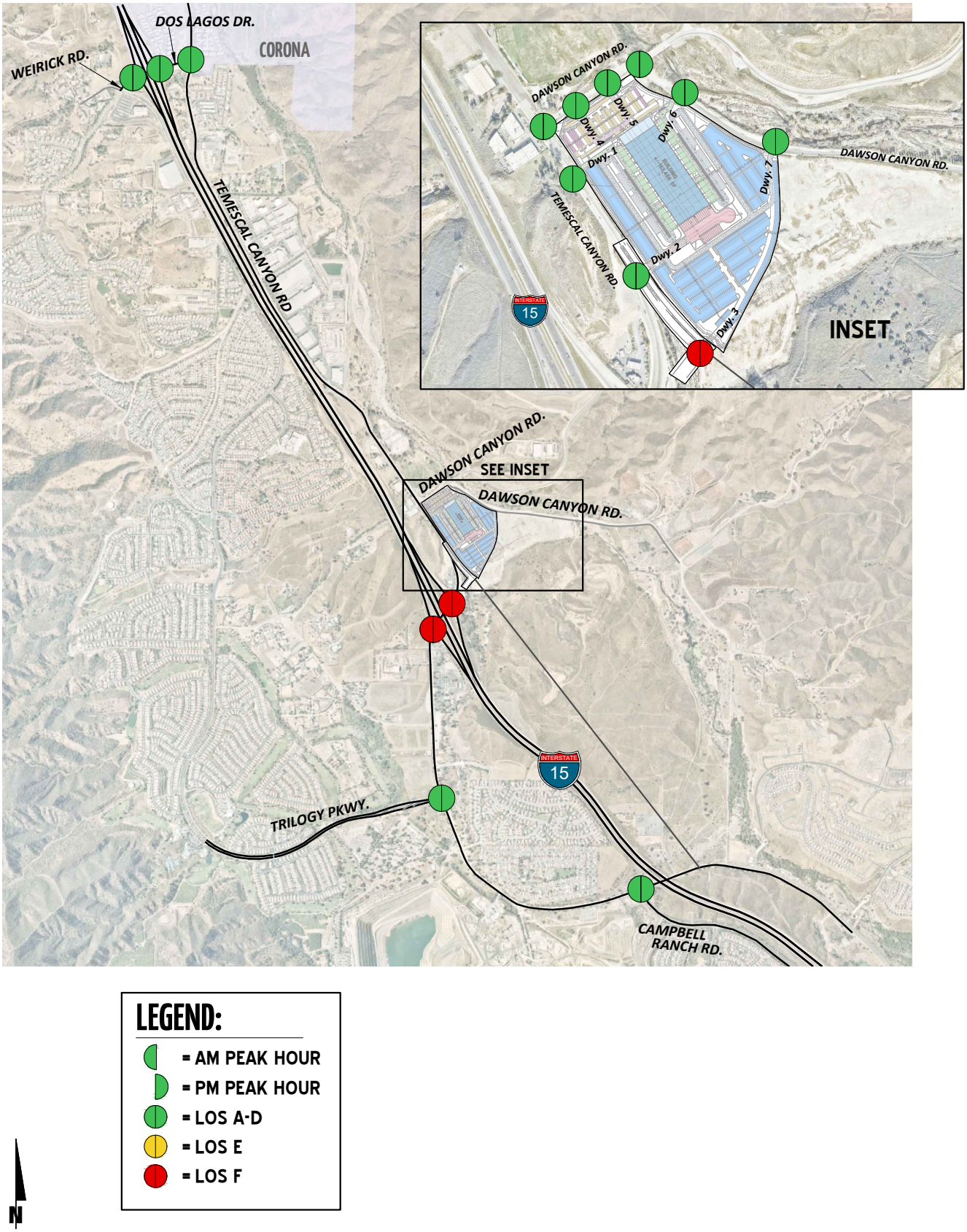
EXHIBIT 7-6: HORIZON YEAR (2040) WITH PROJECT SUMMARY OF LOS



7.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway at Weirick Road and Temescal Canyon Road interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 7-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 7-2, the following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) Without Project traffic conditions:

- I-15 Southbound Ramps & Temescal Canyon Road (#2) SBR – AM and PM peak hours
- I-15 Northbound Ramps & Temescal Canyon Road (#6) NBL/T/R – AM peak hour only

With the addition of Project traffic, there are no additional movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) With Project traffic conditions. Worksheets for Horizon Year (2040) Without Project and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6, respectively.

7.7 FREEWAY FACILITY ANALYSIS

Horizon Year (2040) Without Project mainline directional volumes for the AM and PM peak hours are provided on Exhibit 7-7. As shown in Table 7-3, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Horizon Year (2040) Without Project traffic conditions, with the exception of the following freeway segments and marge/diverge ramp junctions:

- I-15 Freeway Southbound, North of Weirick Road (#1) – LOS F PM peak hour only
- I-15 Freeway Southbound, Off-Ramp at Weirick Road (#2) – LOS F PM peak hour only
- I-15 Freeway Southbound, On-Ramp at Weirick Road (#3) – LOS F PM peak hour only
- I-15 Freeway Southbound, Between Weirick Road and Temescal Canyon Road (#4) – LOS F PM peak hour only
- I-15 Freeway Southbound, Off-Ramp at Temescal Canyon Road (#5) – LOS F PM peak hour only
- I-15 Freeway Northbound, North of Weirick Road (#8) – LOS E AM and PM peak hours
- I-15 Freeway Northbound, On-Ramp at Weirick Road (#9) – LOS E AM peak hour only

Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2040) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Weirick Rd.	SBL/T	360	515 [2,3]	365	Yes	Yes	537 [2,3]	416 [3]	Yes	Yes
	SBR	1,260	52	44	Yes	Yes	52	44	Yes	Yes
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T	1,330	1,244 [2]	1,225 [2]	Yes	Yes	1,265 [2]	1,302 [2]	Yes	Yes
	SBR	530	512 [2]	**1,219** [2]	Yes	**No**	516 [2]	**1,225** [2]	Yes	**No**
I-15 NB Ramps & Weirick Rd.	NBL/T	390	16	57	Yes	Yes	16	57	Yes	Yes
	NBR	1,250	40	39	Yes	Yes	42	39	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T/R	1,340	**1,593** [2]	446	**No**	Yes	**1,634** [2]	549	**No**	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

Table 7-3

Freeway Facility Analysis for Horizon Year (2040) Conditions

Freeway	Direction[1]	Mainline Segment	Lanes[2]	2040 Without Project				2040 With Project			
				Density[3]		LOS[4]		Density[3]		LOS[4]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Weirick Rd.	3	32.1	**45.0**	D	**F**	32.3	**45.0**	D	**F**
		Off-Ramp at Weirick Rd.	3	33.9	**39.0**	D	**F**	34.0	**39.0**	D	**F**
		On-Ramp at Weirick Rd.	3	25.1	**34.6**	C	**F**	25.1	**34.4**	C	**F**
		Between Weirick Rd. and Temescal Canyon Rd.	3	25.0	**39.4**	C	**F**	25.1	**38.8**	C	**F**
		Off-Ramp at Temescal Canyon Rd.	3	29.8	**36.2**	D	**F**	29.9	**36.1**	D	**F**
		On-Ramp at Temescal Canyon Rd.	3	20.5	32.0	C	D	21.4	31.9	C	D
		South of Temescal Canyon Rd.	3	17.8	30.9	B	D	18.0	30.5	B	D
	NB	North of Weirick Rd.	3	**42.3**	**35.3**	**E**	**E**	**42.9**	**35.9**	**E**	**E**
		On-Ramp at Weirick Rd.	3	**38.0**	33.5	**E**	D	**36.0**	33.8	**E**	D
		Off-Ramp at Weirick Rd.	3	30.1	29.9	D	D	30.2	30.0	D	D
		Between Weirick Rd. and Temescal Canyon Rd.	3	28.3	27.7	D	D	28.5	28.0	D	D
		On-Ramp at Temescal Canyon Rd.	3	31.9	30.8	D	D	32.1	31.2	D	D
		Off-Ramp at Temescal Canyon Rd.	3	28.2	23.2	D	C	26.6	23.9	C	C
		South of Temescal Canyon Rd.	3	23.7	19.7	C	C	23.9	20.3	C	C

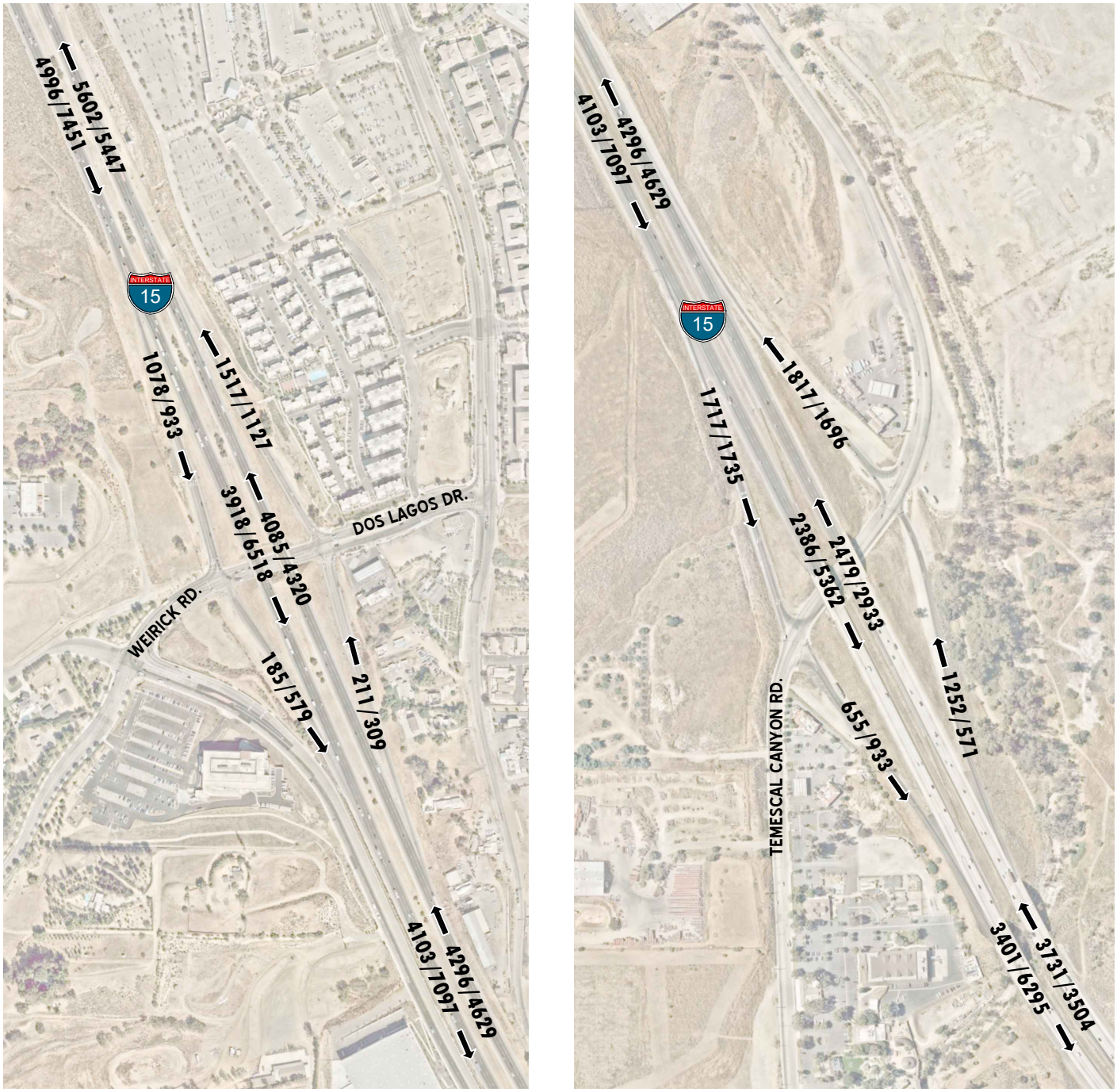
[1] NB = Northbound; SB = Southbound

[2] Number of lanes are in the specified direction and is based on existing conditions.

[3] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[4] LOS = Level of Service

EXHIBIT 7-7: HORIZON YEAR (2040) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

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Horizon Year (2040) With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibit 7-8. With the addition of Project traffic, there are no additional study area freeway segments or merge/diverge ramp junctions anticipated to operate at an unacceptable LOS during the peak hours, in addition to the segments and ramp junctions identified under Horizon Year (2040) Without Project. Horizon Year (2040) Without Project and With Project freeway facility analysis worksheets are provided in Appendices 7.7 and 7.8, respectively.

7.8 DEFICIENCIES AND IMPROVEMENTS

This section provides a summary of deficiencies and improvements for Horizon Year (2040) traffic conditions. Based on the deficiency criteria discussed in Section 2.8 *Deficiency Criteria*, the following intersections were found to be deficient. Improvements necessary to improve traffic deficiencies back to acceptable levels are also discussed below.

7.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been identified at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to acceptable LOS. The effectiveness of the identified improvement strategies discussed below to address Horizon Year (2040) traffic deficiencies are presented in Table 7-4 and described below. The intersection operations analysis worksheets for Horizon Year (2040) Without Project and With Project traffic conditions, with improvements, are included in Appendices 7.8 and 7.9, respectively.

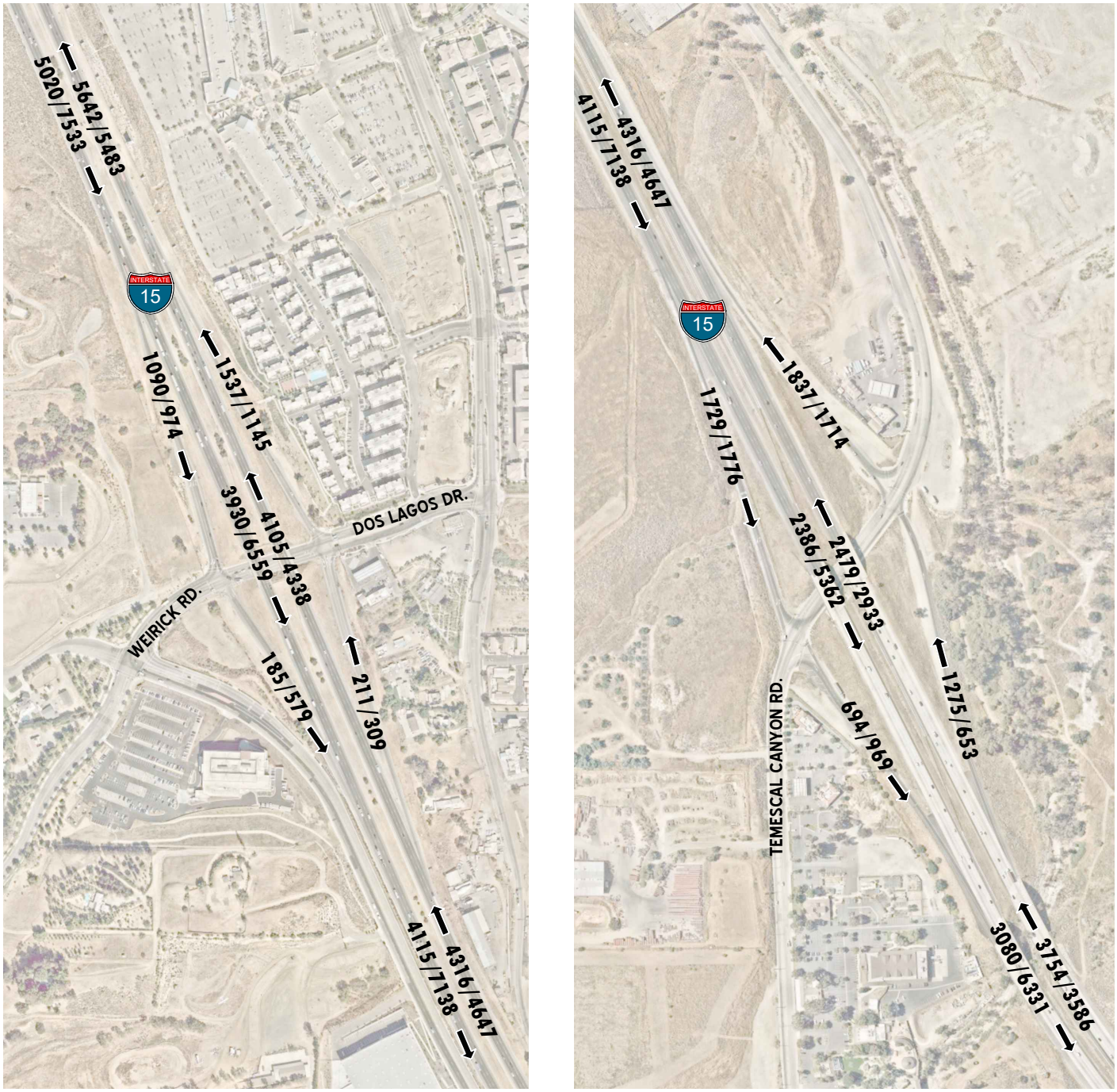
I-15 Southbound Ramps & Temescal Canyon Road (#2) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a southbound left turn lane.
- Add a 2nd southbound right turn lane.

I-15 Northbound Ramps & Temescal Canyon Road (#6) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a northbound right turn lane.
- Add a 2nd northbound right turn lane.
- Restripe the eastbound approach to provide dual left turn lanes and one through lane.

EXHIBIT 7-8: HORIZON YEAR (2040) WITH PROJECT FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

Table 7-4

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
2	I-15 SB Ramps & Temescal Canyon Rd.																	
	- Without Project	TS	0	0	0	**1**	1	**2**	0	2	1>>	1	1	0	34.1	45.6	C	D
	- With Project	TS	0	0	0	**1**	1	**2**	0	2	1>>	1	1	0	40.5	54.5	D	D
6	I-15 NB Ramps & Temescal Canyon Rd.																	
	- Without Project	TS	0	1	**2**	0	0	0	**2**	**1**	0	0	2	1	51.7	30.2	D	C
	- With Project	TS	0	1	**2**	0	0	0	**2**	**1**	0	0	2	1	54.7	31.2	D	C
11	Temescal Canyon Rd. & Driveway 3																	
	- Without Project	**TS**	**2**	**2**	0	0	**2**	**1>**	**2**	0	**1>**	0	0	0	26.8	28.1	C	C
	- With Project	**TS**	**2**	**2**	0	**1**	**2**	**1>**	**2**	**1**	**1>**	0	**1**	0	51.9	49.7	D	D

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; **TS** = Improvement

Temescal Canyon Road & Driveway 3 (#11) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Install a traffic signal (Project design feature).
- Add a northbound left turn lane.
- Add a 2nd northbound left turn lane.
- Add a northbound through lane.
- Add a 2nd northbound through lane.
- Add a southbound left turn lane (Project design feature).
- Add a southbound through lane (Project design feature).
- Add a 2nd southbound through lane (Project design feature).
- Add a southbound right turn lane (Project design feature).
- Add an eastbound left turn lane (Project design feature).
- Add a 2nd eastbound left turn lane (Project design feature).
- Add an eastbound right turn lane (Project design feature).
- Modify the traffic signal to implement overlap phasing for the southbound and eastbound right turn lanes.

With the addition of Project traffic, the following additional improvements are necessary under Horizon Year (2040) With Project traffic conditions and are necessary to provide site access.

Temescal Canyon Road & Driveway 3 (#11) – The following improvements are necessary to bring the LOS back to acceptable levels:

- Add a southbound left turn lane (Project design feature).
- Add an eastbound through lane (Project design feature).
- Add a westbound shared left-through-right turn lane (Project design feature).

7.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown previously in Table 7-2, there are two movements anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows under Horizon Year (2040) traffic conditions. Table 7-5 shows the effectiveness of the improvement strategies at the intersections that experience off-ramp queuing issues during Horizon Year (2040) traffic conditions. With the proposed intersection improvements at the study area freeway ramp-to-arterial intersection (see Table 7-4), the analysis indicates that there are no queuing issues anticipated that may potentially "spill back" onto the I-15 Freeway mainline during the peak hours for both Horizon Year (2040) Without Project and With Project traffic conditions (see Table 7-5). Off-ramp queuing analysis worksheets with improvements for Horizon Year (2040) Without Project and With Project traffic conditions are provided in Appendices 7.11 and 7.12, respectively.

Table 7-5

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2040) Conditions With Improvements

Intersection	Movement[5]	Available Stacking Distance (Feet)[6]	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps & Temescal Canyon Rd.	SBL/T[4]	**1,650**	1,137 [2]	1,286 [2]	Yes	Yes	1,160 [2]	1,367 [2]	Yes	Yes
	SBR	530	113	375	Yes	Yes	115	380	Yes	Yes
I-15 NB Ramps & Temescal Canyon Rd.	NBL/T	1,340	315	488 [2]	Yes	Yes	315	488 [2]	Yes	Yes
	NBR	**600**	522 [2]	34	Yes	Yes	545 [2]	73	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

[4] Consistent with the intersection improvements on Table 8-4, a southbound left turn lane is recommended at this intersection. However, the outputs of the synchro queuing reports are limited to report the queue per movement. As such, the available stacking distance reflected is the total stacking distance of the southbound left and shared left-through lane.

[5] **NBR** = Improvement

[6] **100** = Improvement

7.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

According to the Caltrans I-15 Transportation Concept Report (TCR), the I-15 Freeway is anticipated to be constructed to include the addition of two carpool or High Occupancy Vehicle (HOV) lanes and a general purpose mixed-flow lane. (11) For the purposes of this TA, these improvements have been analyzed for Horizon Year (2040) traffic conditions. Caltrans typically assumes a reduction of 14 percent per HOV lane to the freeway mainline through volumes in this region to account for vehicles utilizing the HOV lanes. The analysis has been performed assuming the same on and off-ramp configurations as existing baseline conditions at the I-15 Freeway and Weirick Road and Temescal Canyon Road interchanges. The reduction to the I-15 Freeway mainline volumes (28% total for two additional lanes) has been applied to account for the proposed express lanes. The analysis has also been performed assuming an additional mixed-flow lane.

As shown in Table 7-6, the I-15 Freeway facilities are anticipated to improve operations to acceptable LOS during the peak hours. Worksheets for Horizon Year (2040) Without Project and With Project conditions freeway facility level of service analysis, with improvements, are provided in Appendix 7.13 and 7.14, respectively.

Table 7-6

Freeway Facility Analysis for Horizon Year (2040) Conditions With Improvements

Freeway	Direction[1]	Mainline Segment	Lanes[2,5]	2040 Without Project				2040 With Project			
				Density[3]		LOS[4]		Density[3]		LOS[4]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Weirick Rd.	**4**	16.2	21.9	B	C	16.3	22.2	B	C
		Off-Ramp at Weirick Rd.	**4**	21.7	28.1	C	C	23.7	28.6	C	D
		On-Ramp at Weirick Rd.	**4**	12.6	21.4	B	C	13.0	21.5	B	C
		Between Weirick Rd. and Temescal Canyon Rd.	**4**	12.1	20.4	B	C	12.2	20.4	B	C
		Off-Ramp at Temescal Canyon Rd.	**4**	20.9	28.7	C	D	21.9	29.0	C	D
		On-Ramp at Temescal Canyon Rd.	**4**	11.4	20.8	B	C	11.8	21.2	B	C
		South of Temescal Canyon Rd.	**4**	7.2	16.8	A	B	7.4	17.0	A	B
	NB	North of Weirick Rd.	**4**	18.3	16.7	C	B	18.4	16.8	C	B
		On-Ramp at Weirick Rd.	**4**	22.1	19.3	C	B	23.0	20.6	C	C
		Off-Ramp at Weirick Rd.	**4**	16.0	16.5	B	B	14.1	16.0	B	B
		Between Weirick Rd. and Temescal Canyon Rd.	**4**	14.4	14.3	B	B	12.2	13.6	B	B
		On-Ramp at Temescal Canyon Rd.	**4**	15.7	15.5	B	B	20.0	20.4	B	C
		Off-Ramp at Temescal Canyon Rd.	**4**	19.6	14.5	B	B	16	11.2	B	B
		South of Temescal Canyon Rd.	**4**	15.3	13.1	B	B	9.4	8.7	A	A

[1] NB = Northbound; SB = Southbound

[2] Number of lanes are in the specified direction and is based on existing conditions.

[3] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[4] LOS = Level of Service

[5] **1** = Improvement

8 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the County of Riverside are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions. Fee programs applicable to the Project are described below.

8.1 RIVERSIDE COUNTY TRANSPORTATION UNIFORM MITIGATION FEE (TUMF)

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2016 to address major changes in right of way acquisition and improvement cost factors. (12) This regional program was put into place to ensure that development pays its fair share, and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

8.2 COUNTY OF RIVERSIDE DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project is located within the County's Temescal Canyon Area Plan and therefore will be subject to County of Riverside DIF in an effort by the County to address development throughout its unincorporated area. The DIF program consists of two separate transportation components: the Roads, Bridges and Major Improvements component and the Traffic Signals component. Eligible facilities for funding by the County DIF program are identified on the County's Public Needs List, which currently extends through the year 2020. (13) A comprehensive review of the DIF program is now planned in order to update the nexus study. This will result in development of a revised "needs list" extending the program time horizon from 2010 to 2030.

The cost of signalizing DIF network intersections is identified under the Traffic Signals component of the DIF program. County staff generally defines DIF eligible intersections as those consisting of two intersecting general plan roadways. If the intersection meets this requirement, it is potentially eligible for up to $235,000 of credit, which is subject to negotiations with the County.

8.3 MEASURE A

Measure A, Riverside County's half-cent sales tax for transportation, was adopted by voters in 1988 and extended in 2002. It will continue to fund transportation improvements through 2039. Measure A funds a wide variety of transportation projects and services throughout the County. RCTC is responsible for administering the program. Measure A dollars are spent in accordance with a voter-approved expenditure plan that was adopted as part of the 1988 election.

8.4 FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion). When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, have been provided in Table 8-1 for the applicable deficient study area intersection. These fees are collected with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

Table 8-1

Project Fair Share Calculations

#	Intersection	Project	2040 With Project Volume	Project % of New Traffic
11	Temescal Canyon Rd. & Driveway 3			
	AM:	160	4,642	3.45%
	PM:	300	5,134	**5.84%**

BOLD = Denotes highest fair share percentage.

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